

THE IMPACT OF THE FEDERAL RESERVE'S MONEY POLICIES ON THE ECONOMY

HEARINGS
BEFORE THE
SUBCOMMITTEE ON
DOMESTIC MONETARY POLICY
OF THE
COMMITTEE ON
BANKING, CURRENCY AND HOUSING
HOUSE OF REPRESENTATIVES
NINETY-FOURTH CONGRESS
SECOND SESSION

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JUNE 8, 9, 10, AND 24, 1976
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THE IMPACT OF THE FEDERAL RESERVE'S MONEY POLICIES ON THE ECONOMY

TUESDAY, JUNE 8, 1976

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON DOMESTIC MONETARY POLICY
OF THE COMMITTEE ON BANKING, CURRENCY AND HOUSING,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10:01 a.m., in room 2128, Rayburn Office Building, Hon. Stephen L. Neal (chairman of the subcommittee) presiding.

Present: Representatives Neal, Hannaford, Blanchard, and D'Amours.

Mr. NEAL. This morning the Subcommittee on Domestic Monetary Policy will begin hearings on the impact of the Federal Reserve's money policies on the economy. To many people, the functions of the Federal Reserve System and its Open Market Committee, which decides the Nation's money policy, remain a mystery. Many Americans do not know how important money policy is to the prices of the goods they buy, the interest rates they pay, their job opportunities, wages, and profits.

Our hearings are intended to cover several specific points which include:

1. How money policy affects the cost of living;
2. How it affects production and employment;
3. How interest rates are affected by money supply changes, both directly and through changes in prices, production, and employment;
4. How government spending and tax policies affect money policy and their relationships to prices, interest rates, production, and employment; and
5. Whether Congress should set goals for economic growth, unemployment, inflation, and interest rate levels and require the Federal Reserve to promote achieving these goals.

In preparation for these hearings, I have asked the staff to compile statistical data on our economy's performance and the growth of money supply, and the level of Federal Government surpluses or deficits since 1954. This work is going forward. To date, it has centered on how money growth and Federal deficits have affected the rate of inflation and the frequency of recessions. We have prepared an exhibit to bring these relationships into focus. As our exhibit shows, the rate of growth of money supply has followed a roller-coaster pattern, which tilted upward since 1964. As a result, we have suffered periodic recessions and since 1964, they have been imposed on waves of inflation.

Our exhibit maps the relationship between inflation measured from 1 month this year to the same month next year to money growth, also measured over 12-month periods, occurring 23 months earlier. The relationship between inflation and money growth was mapped with a 23-month lag because it takes time for changes in money supply to affect the inflation rate; and the staff found, using computer studies, that the effects of increases or decreases in money supply on the rate of inflation peak after approximately 23 months. As the exhibit indicates, the rate of inflation rises and falls in the wake of increases and decreases in the growth of money. About 60 percent of our inflation can be explained by changes in money growth occurring 23 months earlier. And this, let me emphasize, holds as much, perhaps even more, for the 1970's as for the 1950's and 1960's.

[The exhibit referred to by Chairman Neal follows:]

EXHIBIT 1

YEARLY MONEY SUPPLY CHANGES

Percentage Changes From One Month in One Year to the Same Month in the Next Year

Percent Change

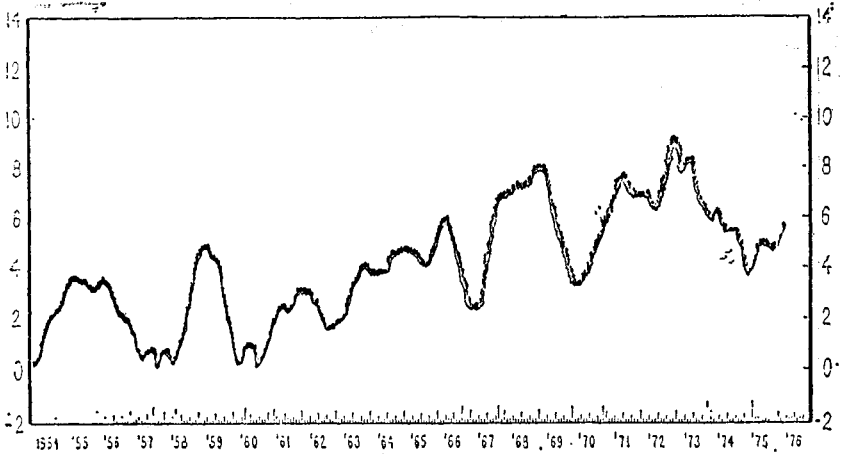


EXHIBIT 1 (OVERLAY A)

RECESSION PERIODS

Percent Change

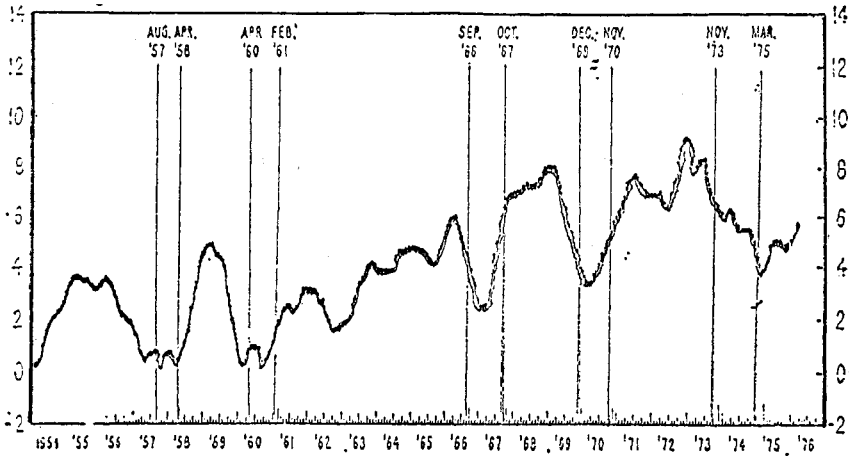


EXHIBIT 1 (OVERLAY B)

YEARLY MONEY SUPPLY CHANGES

Percentage Changes From One Month in One Year to the Same Month in the Next Year

YEARLY CHANGES IN THE COST OF LIVING OCCURRING 23 MONTHS LATER
RECESSION PERIODS

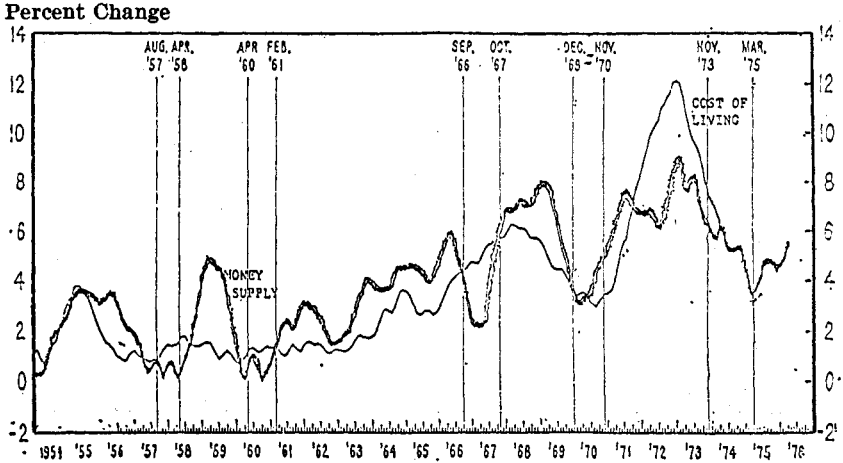


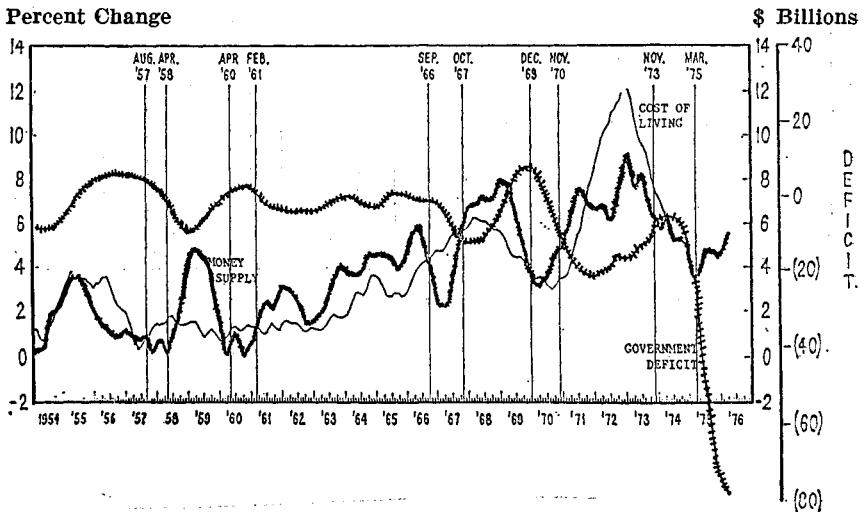
EXHIBIT 1 (OVERLAY C)

YEARLY MONEY SUPPLY CHANGES

Percentage Changes From One Month in One Year to the Same Month in the Next Year

YEARLY CHANGES IN THE COST OF LIVING OCCURRING 23 MONTHS LATER
RECESSION PERIODS

FEDERAL GOVERNMENT SURPLUS OR DEFICIT



The exhibit also shows that each time our economy experienced a recession since 1954, it occurred after the Fed moved to sharply decrease the growth of money supply. Finally, the exhibit maps the relationships between recessions, inflation and money supply and Federal deficits. In this regard, the conclusion that emerges is that the impact of deficits on the inflation rate and recession is weak as compared to that of money growth.

While the subcommittee will refine its work in these areas, the staff also is studying the relationships involving unemployment and interest rates. We hope that the results of this work will produce a better understanding of the ways our economy is affected by Federal Reserve policies and promote the use of responsible guidelines for coordinating monetary and fiscal policies.

This morning we are fortunate to open our hearings by receiving testimony from our distinguished colleagues, Senator James L. Buckley and Congressman Brock Adams. We will question the witnesses together after testimony is presented.

Senator Buckley, we will hear from you first. Senator Buckley is on a tight schedule this morning, and we want to accommodate that as much as possible.

Senator, welcome. We are trying to determine in a very objective way the importance of the Federal Reserve's monetary policy to the economy, how well that policy has been administered over the last several years, and any recommendations our witnesses might have.

The public debate, as you know, centers on fiscal policy; and we know that that is important. But we are trying to now determine the importance of monetary policy.

I know you are on a tight schedule, Senator. If you would like to summarize your statement, please do so, or proceed as you wish.

STATEMENT OF HON. JAMES L. BUCKLEY, A U.S. SENATOR FROM THE STATE OF NEW YORK

Senator BUCKLEY. In my statement I have woven in some statements about fiscal policy. Frankly, in terms of the perceptions in this body, these things are interwoven. If I may, I will omit some portions of my statement. I probably will read most of it.

Mr. NEAL. I did not mean to hurry you. We will be interested in every word.

Senator BUCKLEY. Thank you very much, Mr. Chairman. They will call me if I have to go for a vote. I want to express my appreciation for the opportunity to speak before your subcommittee, Mr. Chairman.

To its credit, the Congress has established in the last 2 years, a method for dealing with burgeoning Federal expenditures. The new House and Senate Budget Committees have been assigned the responsibility of channeling Federal spending so as to make it more responsive to the overall macroeconomic picture.

I am a member of the Senate's Budget Committee and believe that there is great potential for this body to reestablish control over Federal spending and bring it in line with our national priorities and to take a better oversight of the whole economic picture.

I am concerned, however, with the unspoken assumptions that are reflected in much of the work performed by the new Congressional

Budget Office. As you know, this organization was created by the Budget Control Act of 1974. Its mission is to provide nonpartisan technical support for the new Budget Committees and to the Members of both Houses.

However, the evidence suggests a disturbing bias in this Office toward the type of economic policy which was first popularized 40 years ago and which has since proven itself to be unrealistic and costly.

It is unrealistic and costly because it advocates the transfer of resources from the most productive private sector to less productive uses under the supervision of a growing Federal bureaucracy.

It should be quite clear at this point in our economic history that larger Federal deficits will not be stimulative. Larger deficits require large borrowing from the Nation's capital markets.

This same capital could be better employed to produce real goods and services, instead of adding to the ranks of unproductive central planners and public service employees.

Because of its Keynesian bias, much of the analysis emanating from the Congressional Budget Office is shortsighted and often patently incorrect. CBO has advised us, for example, that present inflation rates are not affected by present policy changes.

Therefore, CBO concludes, we need not fear greater Federal spending, larger deficits, and a rapid increase in the money supply.

While CBO is correct that inflation rates are not changed this month by a liberal dose of spending and money creation, the inflation rates a year and a half later are determined by such policies.

A year and a half later we would bear the burden of excessive growth in the money supply designed to help with a short-term problem in the present.

The truth is that the impact of stimulative policies may arrive at a time when the economic expansion is already in full swing; that the stimulative policies supported by CBO projections would generate unnecessary inflation and probably lead to another recession.

These are the policies that a majority in the Congress is inclined to support, but which Presidential vetoes have kept under some sort of rein.

I suggest that the Congress should be wary about placing too much reliance on CBO projections, as these may prove somewhat less than a thousand percent reliable.

CBO predicted inflation in 1976 would be in the range of 6.5 percent to 8.5 percent, and yet we are currently experiencing an inflation rate of about 3 percent. CBO advised against restrictive monetary policy because, according to that Office, it would increase unemployment, and yet the unemployment rate is now falling despite responsibly restrictive rates of growth in the money supply.

And, the CBO warned that such a monetary policy would cause interest rates to rise. Yet in yesterday's New York Times we find an article attributing a rebirth of confidence in the credit markets in part to "the decline in the Nation's narrowly defined money supply over the last 2 weeks," and the expectation "that long-term rates could once again begin declining."

It seems to be clear that investors are now sophisticated enough to anticipate the inflationary effects of an expansive monetary policy, even if the CBO computer models are not.

I go on to suggest that neither the Congress nor the administration should take too much credit for what is happening in terms of our recovery. Actually, because we have not been too active in terms of monetary stimulation, the private sector has more or less taken care of itself.

I then go on to suggest that the Congress—this is beyond the particular scope of this hearing—should concern itself about taking off some of the burden on our productive private sector.

Real gains can be achieved through the elimination of real constraints on commerce. At least, in the longrun, fiscal and monetary policy can only permit real growth in production and income to be achieved; it cannot induce such growth.

It is the perception of this fact that has in part caused Dr. Burns and the Federal Reserve Board to restrain the growth in the money supply at a time when others have been calling for the immediate and rapid growth of the monetary aggregates in a largely illusory pursuit of lower interest rates.

There seems to be little appreciation in some sectors for the intimate relationship that exists between rapid increases in the money supply, high rates of inflation and high interest rates.

And yet, this is one of the best documented relationships in macro-economic theory. The relationship between rising prices and high interest rates was noted at the turn of the century. The connection between the money supply and price levels was established long before that and though lost sight of in recent decades, it is no less valid.

Recent restraint by the Federal Reserve Board in the growth of the money supply has led to reduced inflation and lower short-term interest rates. But there is still work to be done.

Long-term interest rates remain high, and they will be reduced only when investors have regained faith in our management of the money supply.

My emphasis on real growth for the economy brings me logically to discuss next the type of legislation that would be most helpful in our present economic situation. Again I would like to emphasize the need for reducing the economic constraints which abound in our code of laws.

I have got a vote, Mr. Chairman. I have a terribly eloquent statement toward the end.

Mr. NEAL. Is there any chance of your coming back?

Senator BUCKLEY. Let me get a feel for the floor and if I can, I shall.

Mr. NEAL. I am interested in your comments on the relationship of the money supply and inflation.

Senator BUCKLEY. It is recognized in House Concurrent Resolution 133. I was cosponsor of that.

Mr. NEAL. Thank you very much for coming.

[The prepared statement of Senator Buckley follows:]

PREPARED STATEMENT OF HON. JAMES L. BUCKLEY, U.S. SENATOR FROM THE STATE OF NEW YORK

I would like to speak today on the subject of the role of the federal government in the country's economic system, on the capabilities we have to influence that system, and on the responsibilities that we must accept for our intervention in that system.

We can only hope to realistically assist in the stable growth of the macro-economic system if we fully understand our capabilities, our limitations and our responsibilities, for we are dealing with a most delicate mechanism when we attempt to direct the course of the economic system. Therefore, it is essential that the actions we take are those which are realistically complementary to the rest of the decisions made in the private and public sectors.

Perhaps it would be useful, before talking about what the relationship between the federal government and the economy should be, to note the present extent of our expenditures. In the last five years, for example, federal spending averaged twenty-one percent of our Gross National Product. It is quite clear that federal spending activity is already a heavy burden for the economy.

My comments today are directed in part to the question of whether the burden is necessary.

To its credit the Congress has established in the last two years a method for dealing with burgeoning expenditures. The new House and Senate Budget Committees have been assigned the responsibility of channeling federal spending so as to make it more responsive to the overall macroeconomic picture. I am proud to be serving as a Member of the Senate's Budget Committee and believe that there is great potential for this body to re-establish control over federal spending and bring it in line with our national priorities.

But this potential has not been fully demonstrated, as I believe that we can do more toward realistically assessing the value of certain costly programs and substituting for them policies which allow for a more efficient allocation of our finite national resources.

One area of concern which I have watched closely in recent months has been the development of the new Congressional Budget Office. As you know, this organization was created by the Budget Control Act of 1974. Its mission is to provide nonpartisan technical support for the new Budget Committees and to the Members of both Houses. However, the evidence available to date indicates a disturbing bias in this Office towards the type of economic policy which was first popularized forty years ago and which has since proven itself to be unrealistic and costly. It is unrealistic and costly because it advocates the removal of resources and initiative from the more productive private sector so that these same scarce resources can be placed under the control of a growing federal bureaucracy for the production of services which are far down on our nation's list of priorities.

In the long run, Keynesian prescriptions for recovery should be recognized as either inflationary, wasteful or unstimulative to the private sector. Econometric analysis has shown fiscal policy to be ineffective.

It should be quite clear at this point in our economic history that larger federal deficits will not be stimulative. Larger deficits require large borrowing from the nation's capital markets. This same capital could be better employed to produce real goods and services, instead of adding to the ranks of unproductive central planners and public service employees.

One additional problem with the approach used by CBO is that they assume that increases in government spending add immediately to our national product. Therefore, under these assumptions, solving the problem of unemployment merely requires the addition of more federal expenditures to national income. This approach totally ignores the fact that there are lags in the fiscal system.

Under the CBO model, there is little need to worry about inflation, the exact target for full employment levels, or the miscalculation of the timing of impact of these fiscal initiatives. Unfortunately, each of these issues provide, in the real world, the source of additional problems for the economy.

Because of this Keynesian bias, much of the analyses emanating from the Congressional Budget Office are shortsighted and often patently incorrect. CBO has advised us, for example, that present inflation rates are not affected by present policy changes. Therefore, CBO concludes, we need not fear increased spending, larger deficits, and a rapid increase in the money supply.

While CBO is correct that inflation rates are not changed *this* month by a liberal dose of spending and money creation, the inflation rates a year-and-a-half later are determined by such policies. A year-and-a-half later we would bear the burden of excessive growth in the money supply designed to help with a short-term problem in the present. The truth is that the impact of stimulative policies may arrive at a time when the economic expansion is already in full swing; that the stimulative policies that CBO indirectly recommends would generate unnecessary inflation and probably lead to another recession.

While the Congressional Budget Office was set up as a nonpartisan organization, the analyses which it provides reflect a total dedication to a Keynesian fiscal emphasis type of approach.

Perhaps it is this lack of analytical quality which forces the Budget Office into the series of erroneous predictions which we have recently observed. CBO predicted in 1975 that recovery in the automobile industry would not be sufficient to lead a strong recovery, and yet both a strong recovery and a rapid increase in automobile production are realities.

CBO advised against restrictive monetary policy because, according to that office, it would increase unemployment, and yet the unemployment rate is now falling, despite responsibly restrictive rates of growth in the money supply.

Perhaps the lackluster record of CBO in making these predictions reflects the lack of confidence in the private sector which underlies so many of the economic proposals in the Congress and which find support in the CBO projections.

This brings us to the question of who might take credit for the present economic expansion which is solid and expected to continue through 1977. I have watched with some amusement as some individuals on Capitol Hill take pains to ensure that the Congress, rather than the Administration, is credited with the recovery. At the same time, Administration spokesmen are claiming the credit for themselves. I am reminded of the old description of monetary policy as being like a string—you can pull on it, but you can't push. Really, all government economic policy is like that string, and the best that we can do is fail to pull on it. I suggest then that we—along with the Federal Reserve Board—only take credit for failing to rein in economic growth and leave the real credit for economic expansion to the private sector where it belongs.

On the other hand, we in the Congress might best help out the recovery by eliminating the great many structural constraints which are now imposed on the private sector. These constraints function to reduce real gross national product and impose heavy, yet needless costs on businesses and consumers alike. Examples of these types of constraints include unnecessary regulation by the Interstate Commerce Commission over many forms of ground transportation, which distorts their efficiency and adds many billions annually to shipping costs; uncalled-for regulation of airlines rates by the Civil Aeronautics Board; and there is also the unfortunate rigidity of the minimum wage laws which do not take into consideration the need to create differential minimums for teenagers who are less skilled and who do not have an opportunity to be hired at the present minimum wage rates; any employer who might find it attractive to hire these unemployed youths at a lower wage would be in violation of the law, thus many unemployed but ambitious teenagers are, in effect, outlawed from the labor market.

There are many more examples in this list of constraints, but my purpose here today is to emphasize the need for real gains in the economy. Real gains can be achieved through the elimination of real constraints on commerce. At least, in the long-run fiscal and monetary policy can only permit real growth in production and income to be achieved; it cannot induce such growth. It is the perception of this fact that has in part caused Dr. Burns and the Federal Reserve Board to restrain the growth in the money supply at a time when others have been calling for the immediate and rapid growth of the monetary aggregates to reduce interest rates in the short run.

There seems to be little appreciation in some sectors for the intimate relationship that exists between rapid increases in the money supply, high rates of inflation and high interest rates. And yet this is one of the best documented relationships in macroeconomic theory. The relationship between rising prices and high interest rates was noted at the turn of the century. The connection between the money supply and price levels has been more recent, but is no less valid.

Recent restraints by the Federal Reserve Board in the growth of the money supply has led to reduced inflation and lower short term interest rates. But there is still work to be done. Long term interest rates remain high, and they will be reduced only when investors have regained faith in our management of the money supply.

My emphasis on real growth for the economy brings me logically to discuss next the type of legislation that would be most helpful in our present economic situation. Again, I would like to emphasize the need for reducing the economic constraints which abound in our code of laws. But I fear that such attractively labelled but counter-productive legislation as S. 50. The Humphrey-Hawkins "Full

Employment Bill," may prove far too tempting to the Congress. This bill is a blueprint for catastrophe. Let me review some of its more disturbing features. The bill would set about to achieve an unemployment rate for adults of 3 percent, regardless of the cost. It would do this, in part, by making the government the employer of last resort. Plans call for the creation of well-paying public service employment jobs to artificially reduce unemployment statistics. The bill, in effect, calls for a broad centralized planning response to solve the problems of youth unemployment, price level inflation, efficiency in the federal bureaucracy, and a reordering of our priorities in the fields of energy, transportation, health care, the environment and several other key areas of concern to all of us.

While these goals are certainly laudable by any standards, the most notable feature of the Humphrey-Hawkins proposal is that it provides us, with one exception, no indication of how these goals are to be achieved. Thus, we stand right where we are. The bill makes no progress in finding viable solutions to our national problems. The one prescription which is specified in the bill is the use of public service employment to ensure that the unemployment rate is reduced to three percent.

How realistic is a goal of three percent unemployment, and what will it cost? These are questions which must be addressed before a thorough understanding of the bill's destabilizing potential can be grasped. The last time that our economy saw unemployment rates anywhere close to three percent was during the height of the Vietnam War, but these same years also witnessed the beginning of the inflation which we are still fighting. Unfortunately, given the method of calculating the unemployment rate, a goal of three percent is unquestionably beyond reach, given any reasonable assumptions about the growth of the money supply and sympathy for long-range goals.

Should such a goal become law, inflation rates of fifteen percent and above could become a reality. The truth is that this legislation pays only lip-service to the goal of fighting inflation, since monetary policy under Humphrey-Hawkins would be used primarily to attempt to bring unemployment down to a three percent level. Inflation would be induced by the need for large federal deficits to pay for the millions of public service employees required to meet the employment goals and the need to monetize these deficits in order to avoid any increase in taxes.

The public service employment, then, while providing jobs for only a few, would have the wages of the remaining population devalued by inflation. This would hit hardest those Americans living on fixed incomes and would generate pressure for yet another recession.

Another, and perhaps ironic, consequence of S. 50 is that it would most likely hurt those who the sponsors intend to help: the unemployed, unskilled labor. The jobs "created" by S. 50 will be filled with primarily unskilled persons who actually need jobs where training and advancement are possible. Humphrey-Hawkins consigns a large portion of the population, including a disproportionate number of minorities, to a lifetime of unskilled, unrewarding public employment. Government programs, such as Humphrey-Hawkins, would move these groups into a permanent, second-best status and thus are cruel and socially destructive.

How does Humphrey-Hawkins plan to handle the problem of rising prices? By developing a policy for price and wage controls. Again a policy which has never been shown to be effective in the long run for controlling inflation!

Economists really see one limited role for price and wage controls, and this is as a method of demonstrating dedication to the control of runaway inflation. But this is a short-run use for these controls and is based on the logic that if people's expectations about the future course of prices can be altered at the same time that realistic control is established over the growth of the money supply, then the pressure for increases in interest rates and other prices can be eliminated. But we have long ago passed the point where anyone but the least sophisticated observer believes that price controls alone are effective in halting inflation.

Monetary policy is not capable of controlling the inflation rate under this legislation, inasmuch as it is being used to attempt to achieve an unemployment rate of three percent. It is quite clear that, under any set of assumptions, controlling inflation would not be a major feature of the Humphrey-Hawkins Bill.

What, then, can be done to accommodate the real growth of the economy? I suggest that we address our attention to the achievement of longer-range goals, such as price level stabilization and a reduction in the present amplification of the business cycle.

These goals can be achieved by a reasonable control of monetary growth and an attempt to eliminate the large deficits presently incurred in the federal budget. Large deficits are undesirable because they either reduce the amount of capital available in the private sector, thereby restricting real growth, or they induce an increase in the money supply which will generate price level inflation.

Thus, fiscal policy by itself, in the form of deficit spending, has never been shown to produce a net gain in real income. At best a deficit might induce a temporary gain for a few months, but this gain is offset shortly by decreased private investment when the increased interest rates in capital markets reflect borrowing by the Treasury.

Alternatively, the use of monetary policy can have short-run positive effects on the real income of the nation, but I must emphasize the short-run qualification in this statement. For, while the increase in the money supply can make additional capital available to a limited extent, the unpredictability of the results of such action can easily lead to an increase which is too rapid and inflation is the unfortunate result. We do not have sufficient knowledge to make predictions about the results of today's monetary policy on tomorrow's income and price levels to use it well.

Rather, I would like to see a commitment to a fiscal policy which eliminates deficit spending while capping the growth of government spending, and a monetary policy which limits growth in the money supply to a rate consistent with the long-term real growth potential of the economy and a legislative program which eliminates the constraints on commerce that I noted above.

In the early part of 1975, at the nadir of the downturn, I joined with Senator Proxmire in supporting a resolution which contained two very important points involving monetary policy. That resolution, which passed as House Concurrent Resolution 133, established the practice that the Chairman of the Federal Reserve Board announce quarterly the monetary growth targets for the Open Market Committee. But as important as this provision is, I am of the opinion that the adoption by the Congress of a new policy by which monetary growth is guided is more important. Under the resolution the Federal Reserve is directed to establish targets which are in line with the economy's long-term ability to grow. Our problem in the past is that the Federal Reserve's monetary policy has been constructed along lines which were only haphazardly related to this fundamentally important guideline. Monetary targeting which is set independently of the economy's growth potential produces the kind of erratic monetary growth policies which take us from inflationary rates to a constricting zero level, as was the case in the latter half of 1974. It is my view that the stability and duration of the recovery is intimately linked to keeping monetary targets within the ranges recently achieved, and not to the following of false guidelines, such as short-term fluctuations in interest rates.

[At the request of Chairman Neal, the text of H. Con. Res. 133 is inserted at this point in the record:]

H. CON. RES. 133

IN THE HOUSE OF REPRESENTATIVES

MARCH 24, 1975

Ordered to be printed as passed

CONCURRENT RESOLUTION

Whereas article I, section 8, of the Constitution provides that Congress shall have the money power, namely "to coin money and regulate the value thereof";

Whereas Congress established the Federal Reserve Board as its agent, and delegated to its agent the day-to-day responsibility for managing the money supply;

Whereas the United States economy is now suffering from excessively high unemployment and a decline in production and the gross national product, together with inflation; and

Whereas the economy's performance in part is affected by changes in the rate of growth of the monetary and credit aggregates: Now, therefore, be it

Resolved by the House of Representatives (the Senate concurring), That it is the sense of Congress that the Board of Governors of the Federal Reserve System and the Federal Open Market Committee—

(1) pursue policies in the first half of 1975 so as to encourage lower long term interest rates and expansion in the monetary and credit aggregates appropriate to facilitating prompt economic recovery; and

(2) maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long term interest rates.

Pursuant to this resolution, and taking into account the international flows of funds and conditions in the international money and credit markets, the Board of Governors shall consult with Congress at semi-annual hearings before the Committee on Banking, Housing and Urban Affairs of the Senate and the Committee on Banking, Currency and Housing of the House of Representatives about the Board of Governors' and the Federal Open Market Committee's objectives and plans with respect to the ranges of growth or diminution of monetary and credit aggregates in the upcoming twelve months. Nothing in this resolution shall be interpreted to require that such ranges of growth or diminution be achieved if the Board of Governors and the Federal Open Market Committee determine that they cannot or should not be achieved because of changing conditions. The Board of Governors shall report to the Congress the reasons for any such determination during the next hearings held pursuant to this resolution.

Mr. NEAL. Senator Buckley just gave most of his testimony. He was called to a vote in the Senate chamber. We don't know whether he is coming back or not. Mr. Adams, we would certainly like to welcome you this morning.

Thank you very much for coming. This subcommittee is trying to determine the importance of monetary policy to the economy, how well it has been administered over the last several years, and what our witnesses would recommend as changes for the future.

I know the public debate centers around fiscal policy and we are of the opinion that monetary policy plays an equally important, if not more important role in the economic health of this country.

I say again how grateful we are for your coming. Please proceed in any way you would like.

**STATEMENT OF HON. BROCK ADAMS, A REPRESENTATIVE IN
CONGRESS FROM THE STATE OF WASHINGTON**

Mr. ADAMS. As far as public debate is concerned, the number of editorials that have appeared around the country criticizing me for criticizing Dr. Burns on monetary policy indicates that there is an enormous national debate going on concerning monetary policy. I feel strongly about it. I would like to proceed with my testimony which answers the question raised in your letter to me, particularly emphasizing point 5.

[The letter referred to by Mr. Adams from Chairman Neal follows:]

U.S. HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON DOMESTIC MONETARY POLICY,
COMMITTEE ON BANKING, CURRENCY AND HOUSING,
Washington, D.C., May 27, 1976.

HON. BROCK ADAMS,
*Rayburn House Office Building,
Washington, D.C.*

DEAR BROCK: The Subcommittee on Domestic Monetary Policy is scheduling hearings on Federal Reserve policy and the economy on June 8. Many believe that how well or badly our economy performs depends crucially on what the Fed does and, in particular, on how fast or slow it allows the money supply to grow.

Our hearings are intended to sharpen Congressional and public understanding of what the Fed does and how this affects our economy's performance. In specific, we are seeking testimony on:

1. How money policy affects the cost of living;
2. How it affects production and employment;
3. How interest rates are affected by money supply changes, both directly and through changes in prices, production and employment;
4. How government spending and tax policies affect money policy and their relationships to prices, interest rates, production and employment; and
5. Whether Congress should set economic growth, unemployment, inflation and interest rate goals and require the Fed to promote achieving these goals.

We would benefit from your testimony on the above economic questions and policy issues. If convenient, we will schedule you to appear as a witness on June 8 at 10 a.m. in Room 2128 of the Rayburn Building. Please inform me at your earliest convenience about your availability, or have your administrative aide contact Dr. Robert Weintraub at 225-7315.

We look forward to hearing your testimony.

Sincerely,

STEPHEN L. NEAL, *Chairman.*

Mr. ADAMS. I thought perhaps the subcommittee might want to ask me some questions about specific items I may not have covered in depth in my prepared statement.

I will preface my remarks by saying that I think monetary policy must be coordinated with, and supportive of, fiscal policy or else we in the Congress will go through an enormous and futile exercise trying to control Federal spending and trying to bring fiscal policy into a coherent operation. I think what we are doing is essential to the Nation's economic well-being, and I would hate to have our efforts frustrated by a Federal Reserve implemented monetary policy going in a different direction.

I think that that is wrong. I don't think that we can continue that kind of an operation and be at all successful, either in making the country's economic health better or in having some type of control over the Federal debt.

The present point of debate between myself and the Chairman of the Federal Reserve Board is that the actions of the Fed in the field of monetary policy can both increase our expenses in the existing mandatory Federal programs by stopping the recovery and, if the interest rate for short-term 91-day bills is raised 1 percent it will add between \$2 billion and \$3 billion to the interest expenditures of the Federal Government and thus bust the budget.

The elements of my debate with Arthur Burns have been misinterpreted around the country but it is a simple thing.

Mr. Chairman, members of the Subcommittee on Domestic Monetary Policy, it is a pleasure to appear before you today. As you know, the Congress is in the process of instituting a major reform of one of its processes.

This year, we are fully implementing the Congressional Budget and Impoundment Control Act of 1974. For the first time, the Congress has the mechanism for establishing budgetary priorities and developing a coherent national fiscal policy. We not only have the mechanism but we are using it. The first concurrent resolution on the fiscal 1977 budget as we all know was passed on May 13.

In the conference report accompanying the first resolution are the economic assumptions underlying the fiscal policy set forth in the resolution. I think this is a key point where monetary policy and fiscal policy have to mesh.

We stated:

The fiscal policy contained in the conference substitute, in conjunction with a supportive monetary policy, is designed to produce a 6 percent rate of increase in total output (gross national product adjusted for inflation.)

A supportive monetary policy is extremely important to achieve the economic goals set forth by the Congress. We have at this time no way to ensure that fiscal and monetary policy are coordinated. A restrictive monetary policy could offset the expansionary fiscal policy developed by the Congress to move the economy and the country out of the recession.

If there is not enough money to facilitate the real growth, then, of course, the economy, not the price level will stall.

In fact, last summer the Federal Reserve tightened monetary policy, shortly after the tax rebate, causing interest rates to rise and delaying

the full impact of the tax refund. More recently, during the month of May 1976, the Federal Reserve again tightened monetary policy apparently in response to the rapid growth in M_1 that occurred in April.

The rapid increase in M_1 —currency plus demand deposits—is very puzzling. Commercial and industrial loans declined and large certificates of deposit—a form of loans made primarily to corporations—also declined. Treasury deposits at the Federal Reserve did decline and that could explain part of the increase in M_1 .

Treasury drew down some money and spent it. In response to this, the Fed tightened up on policy and short-term interest rates rose from the 4.9-percent range at the end of April to 5.5 percent during the week of May 28.

This increase in interest rates occurred with the unemployment rate still at 7.5 percent and utilization of manufacturing capacity at only 71.8 percent, up only 4.8 percentage points—that is our industrial capacity usage—from the first quarter 1975 recession low of 67 percent. Our plant and equipment are not nearly being fully utilized. We are still almost at the recession level of utilization.

Efforts to increase the utilization of the plant are not inflationary. You are trying to use what is already in place to produce more goods. In fact it has the opposite impact on inflation because productivity increases and more goods are available at lower unit costs.

Monetary policy is an extremely blunt instrument to deal with most of the price increases that have occurred in the recent inflation. The prime causes of that inflation were the OPEC-induced rise in oil prices and large and unusual sales of grain to Russia, and yet changes in monetary policy could not have provided a defense against either of these. In fact, it could have exacerbated them.

Extraordinarily tight monetary policy and extremely high interest rates were used by the Fed to stop the feverish speculation in inventories in 1974. What was really needed in this instance were selective controls on inventory loans rather than general monetary tightness which affected not only speculation in inventories but the entire U.S. economy.

The monetary policy stopped the entire economy, because it is such a blunt instrument. This was a case of using the wrong medicine for the disease, and I sincerely hope that we don't make a similar error again this year.

Because monetary policy can offset the congressionally determined fiscal policy, additional mechanisms for coordinating the two are needed.

The statement of managers that accompanied the conference report on the first budget resolution for fiscal 1977 contained nine major economic indicators: gross national product, gross national product adjusted for inflation (real GNP), personal income, wages and salaries, corporate profits, two unemployment rates, the annual average and what might occur at the end of the year, the consumer price index, and the expected rate on 3-month Treasury bills.

Additional monetary goals could also have been included in the statement of managers. All of this is obviously too much information to put in the resolution itself, although it is useful to put this in the report. Many of these economic variables are interrelated.

Personal income, profits and wages and salaries are part of the gross national product. The unemployment rate is related to the rate of growth in GNP adjusted for inflation.

If the economy, or some substantial portion of it, is not operating at full capacity, there is not enough economic activity, people are not hired, and the unemployment rates go up. I have found in my discussions with people such as Walter Heller, that many of us concerned with the national economic outlook find our philosophies were shaped in an earlier generation where economics and the political activity of the country were closely interrelated.

We find now that everything has become so specialized in economics that we are using bigger and bigger words and dealing with more and more esoteric specialties. All of this can often cloud some very simple relationships such as—if the economy is not working very well, people don't have jobs to go to whether they want to work or not.

Prices are also related to rates of growth in GNP, particularly when unemployment rates are low. But when unemployment rates are high and manufacturing utilization rates are low, high interest rates do not control inflation because there is no excess demand by business for money to expand plants, hire people, or increase inventories.

Classic inflation is usually handled by a tight money policy. We have not had that in this country in years. We have not had the unemployment rate down into the range where it was in the sixties since 1970. We do not have too many dollars chasing too few goods.

The only time we find ourselves chasing too few goods is in a certain number of limited bottleneck situations on raw materials or an increase in the price in oil or an increase in price in food such as occurred when we did away with our grain reserves by selling them overseas.

But those are spot situations and you don't handle them in the classic way by saying you can't borrow any money because of high interest rates.

Prices may be affected by other factors: wage settlements; oil price increases; grain deals; weather; and business speculation, to name a few. Interest rate increases do not control these kinds of inflation and can make it worse.

It is also extremely important that the economic goals included in the statement of managers be realistic. Two economic targets that should be included are a rate of growth for real GNP—that is adjusted for inflation—and a rate of price increase, since these drastically affect the revenues and spending total contained in the resolution.

Ideally these targets should be ranges, for example, the statement of managers accompanying the current resolution calls for a rate of growth in total output—GNP adjusted for inflation—of 5½ to 6½ percent.

We know that we cannot be precise with these targets, but will have to keep them within a range. A range on the price target—that is, rate of inflation—is politically more difficult to specify—especially the lower end of the range, because ideally we would like that to be zero.

Realistically we cannot expect the inflation rate to be zero. Our price indices are not perfect. Not all changes in quality are fully filtered out. Thus it may be feasible to have only a price ceiling rather than a range.

In other words, we should place in the resolution something to the effect that the inflation rate should be no more than 5 percent or 4 percent, realizing that we are trying to get it down to zero.

That greatly affects fiscal policy because we now have so many programs that are indexed to the inflation rate such as pension programs and others.

These two major economic indicators that I mentioned may be enough to give direction to the Federal Reserve Board on monetary policy. Monetary policy should aim to achieve the rate of real growth in total output. However, if the rate of increase in the general price level begins to exceed the price ceiling, it would be a signal to the Federal Reserve to restrict monetary growth.

A third economic goal could be included—a range on the short-term Treasury bill rate since that affects category 900 of the Federal budget—interest costs—and has a major impact on the total business activity in the Nation.

However, I have not yet decided whether to advocate the inclusion of bill rate targets until we have had more experience in this area. I would like to start with the real growth and inflation targets first and see if they are sufficient to bring about the desired coordination of fiscal and monetary policy. If they prove not to be sufficient, further thought must be given on how to achieve that integration.

Mr. Chairman, that completes my prepared statement. I do have, of course, information that can respond to the other questions in your letter but I thought we might possibly handle that in the question and answer period.

Mr. NEAL. I would like to thank you, our distinguished chairman of the House Budget Committee for coming. Have you given any thought to including in the budget resolution—I don't want to say targets, but I would like to say specific interpretations—of what the budget resolution means in terms of levels of inflation and unemployment?

Mr. ADAMS. We have given thought to putting that into the budget resolution. It has been my position that we should not do so this year until we have put the new budget process through one Congress and everybody has a chance to see how it works.

However, I think that eventually the budget resolution is a logical place to include such data. That is what I was trying to address in my prepared statement. We probably should start with the statement of the managers on the conference and then we can build a legislative history around it.

We can see then whether or not monetary policy responds to it. If it does not, then perhaps we will have to take the next step.

Mr. NEAL. The reason I mentioned those goals specifically is because it seems to me that those are goals that the Fed could deal with, could understand and they could address these problems directly as opposed to some other measures.

Mr. ADAMS. I think you are right. I think those are key indices that certainly can give a coherent package to the Federal Reserve to show them clearly what we are doing. One of the problems we get into is that the Fed operates on a week-to-week basis, sometimes on an almost day-to-day basis.

I am always concerned that they react too quickly on unexpected movements in the market rather than not quickly enough. What is happening today is that the Fed is reacting on an almost day-to-day basis on what they perceive as an increase in the velocity of money.

We are operating under a budget resolution that is of course taking us a year to complete and will go into place in October. That is why I am having the argument with Dr. Burns. I am trying to say to him that the 91-day bill rate should stay within the averages referred to in the underlying materials accompanying the resolution. The reason is that we are going to roll over nearly \$200 billion worth of debt this year and most of it will be in the short-term market.

An increase of interest rates of 1 percent starting in October and going through the fiscal year—and that is the dilemma we are approaching—can add some \$3 billion to the Federal deficit.

We assumed in the resolution an average interest rate for the year of 5.5 percent. If the Fed increases that to an average of 6.5 percent for next year, category 900 will go up \$2.5 billion. Everyone will wonder why the deficit has to be raised by \$2.5 billion when we did not do anything. The answer will be that the Fed did it.

Mr. NEAL. Mr. Adams, if I can, I would like to draw your attention to this chart. We have charted with the black line yearly money supply changes in the economy.

Over that, we have superimposed a line showing the yearly change in the cost of living occurring 23 months later. The reason for the 23-month lag is because our staff, through computer studies, found that the maximum effects of increased or decreased money supply on the rate of inflation occurred at that point. It wouldn't look much different if the lag were 20 months, or 22 months, or 24 months. The point is that the rate of inflation in the economy does not respond immediately to changes in the money supply but responds with a lag averaging about 23 months.

Senator Buckley, welcome back. I would like to draw your attention to this chart also. The black line shows the yearly percentage changes in the money supply. The red line is what I call the rate of inflation with a time lag of 23 months.

We were just explaining the 23-month lag. And as I just stated, our staff's computer studies show that the maximum effects of increased or decreased money supply on the rate of inflation are evident 23 months after money supply fluctuations.

When the money supply rose dramatically, the cost of living increased rather dramatically as we charted it through time. Now the next feature on the chart shows the recent periods of recession, shown by the periods between the green lines. What this also shows is that when there is a sharp decrease in the money supply, we experience periods of recession soon after.

The most dramatic thing about the chart, I think, is its rollercoaster nature. We have had increases and decreases in the money supply and this seems to be reflected in the pattern of economic life in America. It seems to be from looking at this chart—we have been working with this now for several weeks, discussing and revising it—it appears that the money supply is very important in determining levels of inflation and levels of recession.

This orange line represents Federal budget surpluses and deficits. Here we find a relatively weak relationship to the whole picture.

Mr. ADAMS. I was never able to find any because we charted those factors precisely the same way, Mr. Chairman. Obviously the deficit can become too large and, you can overload monetary growth. But as far as year-to-year relationships are concerned, we have never found any.

Mr. NEAL. To me that is very fascinating. The public debate is on the level of budget deficits—the popular subject is that deficits are the total cause of inflation. We find they are hardly the whole cause.

Our staff economist tells us that we can attribute statistically something like 60 percent of recent inflation to monetary policy with that 23-month lag. The deficit appears to count for no more than 30 percent. Obviously there are other factors that affect the rate of inflation, such as oil and food prices. But our statistics indicate that monetary policy gyrations were primarily responsible for 60 percent of the recent levels of inflation. Of course, this is preliminary; and we would be grateful for your comments on these facts.

Mr. ADAMS. Let me say that we have done the same thing in terms of charting the relationship between deficit, money supply, gross national product, and unemployment. As you heard me say many times, I advocate that we go to a balanced budget at full employment. The Government should live within its revenues.

That will be the thrust of our effort in the next 3 or 4 years, to accomplish that. But I do not think that that is going to solve the problem of inflation and unemployment. I think it is simply a stabilizing factor which is important for the whole economic climate of the United States.

Coupled with that what we need in money supply is a matching of the money supply to the real growth in the economy. The argument which is being made by the Federal Reserve at the present time is that their instruments of either their open market activities, changes in the reserve rate, or changes in the rediscount rate all of which as I said before are very blunt instruments, should take into account the velocity of the money supply as well as the absolute amount.

This has led to the Federal Reserve saying we can tighten the money supply because people are using their money more efficiently and still match the growth in the economy.

I do not believe that. I don't think we know enough about the money supply. What we are looking for in the way of monetary policy from the Fed is that as economic growth occurs, not that M_1 be pumped up and we use the money supply to stimulate the economy, but that we not use it to crunch the economy. That argument has not been resolved and that is something that I hope this subcommittee will both communicate to the Federal Reserve and to the other members.

Mr. NEAL. What you are advocating, if I understand you, is a rather consistent rate of increase of money supply in keeping with the goals of the budget—full employment without inflation.

Mr. ADAMS. If you will look at the period between 1960 in the middle of your chart and continue up through the beginning of the Vietnam war, which was February of 1965, you will see that we had a rate of

inflation that ran below 3 percent. Our unemployment rate was coming down. It had been at 6 percent in the early sixties. The reason I take that particular time period is because the Vietnam war period does distort things. In other words, if you are very conservative, you say the only reason we got unemployment down is because we had a war.

If you are liberal, you say that general economic policies were successful. During that period some of us were saying, and the Council of Economic Advisers was in agreement, and the Federal Reserve and the Congress was in agreement—that we were trying to come out of the recession period of 1958. You also had at that time a relatively low deficit and you had a low interest rate. I am saying that that condition of low unemployment and low interest rates can be repeated again and that is my personal goal.

Mr. NEAL. Senator Buckley, welcome again.

Senator BUCKLEY. I find myself in substantial agreement. I believe there is an obvious correlation, and studies have gone further in pointing out the relationship between money supply and rate of inflation. Way back, banks did not issue credit instruments unless you had production to match the instruments that were being handed out.

But I do agree that our goal has got to be toward creating a stable environment, a predictable environment. We should have as a goal the increase in money to match the increase in productivity and labor force growth.

This will create stability in which other factors in the economy can operate. Then we are talking about whether or not we are going to raise taxes. We have had pressures. Whether we are going to raise taxes to meet current higher levels of higher spending, or are we going to in effect lower the Federal take out of the economy to leave more behind in the private sector with which to produce the jobs.

Mr. NEAL. You would advocate a moderate and steady growth in the money supply—

Senator BUCKLEY. To match the average growth that we project for the economy?

Mr. NEAL. If the economy is growing at the rate of 5 percent, you would advocate a growth of 5 percent in the money supply? If the economy's growth potential decreased, would you advocate a decrease in money growth?

Senator BUCKLEY. Yes.

Mr. NEAL. I will now yield to the gentleman from California.

Mr. HANNAFORD. Both of you coming from different directions say the same thing about money supply. Both of you advocate a balanced budget perhaps with less fervor or enthusiasm. Would you apply something of the same standard that you are applying to the growth of the money supply and that is we would try to balance the budget but would not get too upset about it if the growth of debts did not grow as fast as GNP? Senator Buckley?

Senator BUCKLEY. Well, I personally would like to see some black ink once in a while. My fear is that if we start talking about a permissible level of deficit which can be financed in a manner that does not require creating money faster than projected growth, yes; we can absorb the burden. But I recall when President Nixon unveiled the concept of full employment and budgetry, it started fine. But at the

same time it seems to me that it is awfully hard for a legislative body to say that \$12 billion of deficit is OK but \$13 billion is not. I would like us to reach black ink and over a period of years average it out.

Mr. HANNAFORD. Realistically, it is difficult to achieve a balance between red and black ink over the long run. We would like to balance the—between red and black ink out in the business cycle.

Has the Senator completed his statement, or did he have anything more in the way of a formal statement?

Senator BUCKLEY. I had one which was interrupted by a vote, and I don't know how to pick up the pieces again. Basically, I urge that the Congress not follow—not yield to the temptations to politicize the Federal Reserve—which is inherent in the Humphrey-Hawkins legislation—and that it maintain the posture it took a year ago with House Concurrent Resolution 133, to adopt standards to guide and govern the monetary policy.

Mr. HANNAFORD. Mr. Buckley, I guess I am a little out of step here because the purpose of these hearings is to establish the importance of monetary policy. I have always had a very strong feeling about its importance.

So I am going to, I guess, shift to the politics of it. Accepting that these facts are true and that it is of fundamental importance and that it does contribute some 60 percent of the inflation problem, we must follow the simple dictum that Chairman Adams suggested that we create enough money to buy the things that need to be bought.

Also, there has to be a coordination between monetary policy and fiscal policy if we accept these things. Do we accept that?

Senator BUCKLEY. I would disagree. I would suggest that the role of monetary policy is to create a stable environment by the more or less predictable increase in the money supply to match the projected increase in production so you have a price stability which establishes the expectations within which the private sector can operate.

Then the fiscal policy has its impact within that spectrum. If we spend too much and the Federal Government has to borrow too much out of the capital markets, you run up your interest rates. This ought to be the leverage on the Congress to have self-discipline.

Mr. HANNAFORD. Well, I am bothered by the fact that Brock Adams' statement regarding the cause of inflation recently being in relation to increasing energy prices and food prices is diametrically opposed to Chairman Burns' previous statement here. We had the Chairman of the Federal Reserve Board here consistent with the requirements of House Concurrent Resolution 133 last summer. He said he was increasing interest rates or following a more restrictive monetary policy because of increases in commodity prices and because the tax cut which we instituted, \$22 billion, was beginning to take effect, and there were too many dollars floating around and we had to react to that with monetary policy. It disturbs me a great deal that we have conscious and intelligent efforts conflicting with one another.

I don't see how we can run the economy of the country having the left hand taking away what the right hand is doing.

Mr. ADAMS. That was precisely the reason why we have gotten into the argument that is going on now between some of us on the Budget Committee and the Chairman of the Federal Reserve. Simply put,

my statement to him is that if you are going to, in effect, soak up the money supply after we had gone through great efforts to provide increased fiscal stimulus to come out of the recession, you should have told us in the first place, and we would not have bothered to pass the tax cut.

There is just no value in going through enormous exercises here which are finally agreed upon between the Congress and the Executive, and then to have our efforts frustrated in the name of independent monetary authority. I am not saying that the Congress should be operating on the size of the money supply. We should not be doing that. But we should not expect that the obvious policy established is going to be frustrated as we proceed.

I am concerned that this is about to occur again. We are concerned that next year the economy will go into recession. That is the reason there are several portions of the total budget package saying that we must continue Federal assistance for a few years until we are sure the recovery is solidly in place. And if that is frustrated by a rapid increase in the interest rates, we should not be involved in making such an effort in the first place.

Mr. HANNAFORD. Would both of you agree that your major criticism of the Fed policy is that it operates in fits and starts instead of looking a long way down the road?

Senator BUCKLEY. Precisely. This is where I hope House Concurrent Resolution 133 sets some guidelines to take the longer range. Dr. Burns has testified about the fine tuning. If you pull the string, you just push it. I have a live quorum. I might have to leave soon.

I would like to make one observation. You were talking about the contribution to inflation of the rising energy costs. Even though we had wage and price controls, we reached an annual rate of 9.5 percent inflation before the Arab oil embargo. Energy was a one-time price increase.

We had as a result of dickering with the money supply the pressures for that inflation that just burst through the seams.

Mr. NEAL. Mr. Hannaford, would you yield? Senator, you mentioned the problem of politicizing the Fed. I would like to ask if you think this chart is accurate and if you think that Fed policies have been well administered over these years?

Senator BUCKLEY. My answer would have to be no.

Mr. NEAL. If you don't think it has been well administered what would you suggest?

Senator BUCKLEY. I would like to think in the last year it has been better administered than it has in the past. Before that it was always reacting too late or too early.

Mr. NEAL. When you say you don't want to see it politicized, do you mean you don't want to see us go further than House Concurrent Resolution 133?

Senator BUCKLEY. I would hate to see us establish legislation of a Humphrey-Hawkins type to manipulate the economy. I am sorry I have to run. I appreciate the opportunity of being here.

Mr. NEAL. Thank you very much.

Mr. HANNAFORD. Mr. Chairman, I yield the balance of my time. Before I do, though, I want to say that I am very glad that at the time in history when we established the budget process that Brock

Adams was in Congress because if he had not been, I'm not sure it would have worked.

I think it is a historic achievement which you have accomplished, Mr. Chairman, and I thank you.

Mr. NEAL. Mr. D'Amours?

Mr. D'AMOURS. I thank the chairman for recognizing me after Senator Buckley left. My questions were going to be directed to Senator Buckley.

Congressman Adams has referred to a problem and I wondered, Congressman Adams, if you could tell me what positive directions do you think we might be taking to go beyond House Concurrent Resolution 133 which is nice frosting but not very substantial in terms of—it is a control but certainly not a very strict or definite control.

What can we do short of politicizing the Fed which I don't suppose anybody wants—not that anybody does not believe it is already politicized—what kind of controls short of Humphrey-Hawkins are available to us?

Do you see any range of options?

Mr. ADAMS. I think you can consider, one, specifying to the Fed the ranges of the money supply that we in Congress deem necessary for the next fiscal year and that we not simply allow the Federal Reserve to say they agree with us and then go off and do something different. For example, the Federal Reserve indicated to this committee and the Congress originally that the range in the rate of growth in money supply should be 4 to 7½ percent this next year. Yet Dr. Burns, within the last 2 months, has said no, it is going to be 4 to 7 percent. This means that we have a year's program laid out in that budget resolution and yet one of the key assumptions, one man or the whole Federal Reserve Board has at some point sat down and said we are not going to do that.

Second, you can actually go to a range on interest rates. I don't think you could call that politicizing the Fed but I certainly think that once you establish a fiscal policy for fiscal year 1977, let's say, from October 1, 1976, through to October 1, 1977, that you can indicate a range for interest rates and you would take off from the range where you are now. In this way you would not be signaling to the money markets that there is going to be some big pump up or a crunch down, but that these ranges are necessary. That is what I was referring to. I have not staked out a flat position to you that you ought to use the 91-day bill as the key, but you can do that.

A third principle is this: This subcommittee should consider recommending to the full committee the potential of using selective reserve requirements and fuller regulation of the banking system. The reason your chart reflects an inflationary increase goes to a belief that I personally have. Now, this is my personal opinion. A great portion of the inflation in the past 8 or 9 years—other than the war inflation which was obvious—came in the financial community. By financial I mean financial tied in with business—in speculation in inventories and in the establishment of conglomerates.

I think the formation of conglomerates has added to inflationary pressures. It works like this. I have a glamorous electronics system that is selling at \$50 per share. You own a smelting company in Montana that is selling at \$12. Without changing my plant or without

changing your plant, I form a conglomerate and buy you out. In buying you out, you get a rise in your stock price of anywhere from 12 to maybe 20 points.

The drop that occurs in the merging, glamorous stock, would be very slight. You would end up with the stock of both plants selling at 45 which is, for your smelting plant, 30 points of pure water.

There is no more production, there are no more people working. Nothing has changed except the total price went up. Even worse, I don't have any money so I go out and borrow. In other words, I increase the money supply by going to my bank and signing a note for \$30 million to buy you out.

Now somebody is in there competing with me, at say, the First National Bank of whatever town you want to go to and they are trying to borrow for their inventory to buy enough widgets to produce for the year ahead and they are only willing to pay 7 percent.

I have a sure-fire deal with you so I can afford to bid that interest rate up to 9 percent, 10 percent, 11 percent, 12 percent, because I am going to write it off on any income tax and I am going to make the profit out of the rise of the stock cost. So I have had a double inflationary impact.

You can also do it with inventory. I don't need any, but I think there is going to be inflation so I go out and borrow money and I buy up parts for my inventory, borrowing the money, not putting any more people to work. I speculate if I buy it today, it will cost me \$10 and if I buy it next year it will cost me \$12. I buy up at \$10 all I can get my hands on. I stock my warehouse completely. I use borrowed money. I write off the interest rate. If the inventory goes to \$12 next year, I shift my accounting system from first in first out to last in first out and I pick up \$2 an item on everything I have got.

There is no more production. It is pure speculation. That cannot be controlled by simply raising interest rates because I will bid anybody out of the market on those conditions. I will bid you out as you try to borrow money to buy a house. I will bid you out as you try and raise money for your small business. I will bid the farmer out for whatever he is trying to borrow in order to produce that year because I am in the speculative end of it. The only way you can control that is with selective reserves. You are saying to the bank well, we will not allow more than 15 percent or 20 percent of your lending to be done for these kinds of purposes.

That was advocated by Board Member Andrew Brimmer back in the sixties and we fought that back and forth with the Federal Reserve for years. They, say, well, we can't do it. But to me, raising the interest rates does not control inflation. In fact it can feed it. Because when I push the interest rates up to 12 percent you, in your small business, have got to borrow at 12 percent rather than 8 percent, you have got to tack on to your prices what you can't write off. If you are going broke like the railroads and W. T. Grant and everyone else, you can't write it off because you don't have any income. You have to raise your price.

Mr. HANNAFORD. I believe we are simply talking about allocating credit in this manner.

Mr. ADAMS. In a gross sense.

Mr. HANNAFORD. We have fought the same battle in this room last year. It gave the Chairman of the Federal Reserve Board the suggestion.

Mr. ADAMS. There are new days coming.

Mr. D'AMOURS. I have no further questions. Thank you.

Mr. NEAL. Mr. Adams, I would like to pursue your comments on interest rates again. How would you like to see those interest rates regulated?

Mr. ADAMS. Well, I think the best you can do is to use a range. In other words, we don't want to have the Congress involved in saying, all right, the interest rate on the 91-day Treasury bill will be 5 percent in January and 5.2 percent in February and so on. Obviously the money managers—the Fed must control that sort of thing. But I do think—and I mentioned this in my testimony—this committee should consider whether we should have a range of interest rates such as we put in the statement of managers accompanying the resolution this year, 5.5 percent average from the period of October 1, 1976, to October 1, 1977, with a trigger mechanism by which the Fed comes back before the committee and says conditions are thus and so and we think there should be a change in the range. At that point you make a recommendation to the Congress. If you want to include it in the budget package, we can go with another concurrent resolution saying it is going to cost us this much more. I would have no objection to our coming in and redoing it. You could get a photograph of the economy at various points during the year.

If things have changed drastically in commodities or food prices, this committee recommends to the House and the same on the Senate side that a change is necessary to fit the new picture. We all know what we are doing.

Mr. NEAL. The only way the Fed has of changing interest rates is to change the money supply. Isn't that right?

Mr. ADAMS. They can change their discount rate. They can change their Federal funds rate through open market activities.

Mr. NEAL. But these actions change the money supply, don't they?

Mr. ADAMS. Yes. In the very sophisticated society, if you change any of these factors, money supply will follow. But money is not in and of itself. Money supply is a factor that changes by Federal Reserve policy. That is why there is this argument about velocity that we are into now. We have so many new sophisticated financial instruments and people creating new ones all the time. But the money supply was created by the Fed and is the underlying factor. All these other things follow.

Mr. NEAL. Including interest rates probably.

Mr. ADAMS. Including the interest rates, but not on a 1-to-1 factor. In my opinion, at the present time interest rates on the short-term bills are going up strictly from Federal Reserve, and not from anything else going on in the economy. In other words, there can be times when the interest rates are going up because of other factors in the economy and not the Federal Reserve. The Federal Reserve has had in effect a loose money supply since about September 1975. But they were pushing the string. The money supply did not grow during that period because all they can do is make it available and if nobody comes to the window and takes it away, M_1 does not grow.

We don't know what caused M_1 to rise so in April. What I am saying to you is that bank demand was down, corporate demand has been down and other demand has been down so the market is not pushing up interest rates at this particular moment. The Fed is. I think that is wrong. It does not have anything to do with the growth of money supply right at the moment. They are not in a 1-to-1 ratio.

Mr. NEAL. But by fiddling with the interest rates, they will also be fiddling with the money supply?

Mr. ADAMS. That is correct. The optimism in the economy or lack of it, costs in key commodities and individual decisions made by companies as to whether they want to have more money available is the multiplier effect that goes with the Fed action.

Mr. NEAL. There is another interesting thing on this chart and that is whenever we have an expansionary money supply, we have inflation. Whenever we have contracted money supply, we have recession.

Somewhere in between it seems to me we have the right course. Perhaps as a result of these hearings, we will be able to formulate a target range of money growth for continued economic recovery and avoid fighting that battle of politicizing the Fed.

Mr. ADAMS. I think politicizing the Fed is an enormous red herring.

Mr. NEAL. I think it is, too, but it has popular support.

Mr. ADAMS. It has popular support in the elitist part of the United States. The activities that took place in 1961—and I would strongly suggest that if you have not already contacted him that you have in for example either Walter Heller or Charles Schultz to give you specifics on it because a lot of us were involved much more peripherally than they were.

But I think the people support the Government making a conscious effort to see that the economy runs smoothly and well. That is a very different political position from those who say the Government should get out of all fiscal activity. In spite of the hammering, in spite of the public positions, in spite of the television every night saying that everybody hates Washington, if you go to the people and not just keep polling the top, you will find an underlying feeling that the Government is the one place where people elect their representation. And as bad as the Government may be in getting things done, at least people can communicate with elected Government officials concerning something that affects their destiny.

The people don't want to throw the Government out. They don't want it to be dictatorial but they think it should be involved in seeing that they have a job, that the prices are not going out of sight, and if they want to buy a house that the interest rates are low enough that they can afford it. I still believe that in this country, most of the people believe the Government should have a role in that because they can get at the Government.

They can throw you and me out. But you can't throw out the head of A.T. & T. and you can't throw out the head of the First City Bank and you can't throw out the head of the labor unions that are involved in your city and you can't get at anybody else. Government becomes the forum where you can try to make your life a little better. You, Mr. Chairman, and this subcommittee, are directly involved in one of the key factors that people are interested in. They want to know

why it is they cannot buy a house today, for example, which is in the jurisdiction of this overall committee on which you sit. They can't understand why interest rates that they grew up with running from 4 percent to 6 percent can't ever be found anymore. I think that that is part of our job, to produce an answer.

Mr. HANNAFORD. Would the chairman yield?

Mr. NEAL. Certainly, the gentleman from California is recognized.

Mr. HANNAFORD. I am afraid that you are more optimistic than I am, having had short experience on this committee. We have had two experiences that convinced me that the Federal Reserve is so enshrined that you can't approach it politically. We did early last year try to get some allocation of credit action.

By the time it had gone through the influence of Dr. Burns and the minority, we came out of this committee with something that was a watery statement of good intentions about allocating credit. It went to the floor of the House and I think lost by something like 2 to 1.

Last month, just 2 or 3 weeks ago, we had something that we called the Federal Reserve Reform Act that we reported out of the committee. A central feature of that Reform Act was to try to bring the Fed more within the point of view of contemporary Congress and the administration—in other words, have the President appoint Federal Reserve presidents.

That was thought to be by the authors in the committee, the subcommittee, the central feature of that piece of legislation and that was stricken out by the House committee and that prevailed on the floor of the House of Representatives.

I might say I supported that view because I knew it would never pass the House without it. But one does have to be pessimistic, Mr. Adams, about the future in this regard.

Mr. ADAMS. Mr. Hannaford, we are in a period of divided Government. Two very conflicting philosophies are in collision and have been for the last 8 years. If this continues, next year your frustrations will continue. If it does not, then you may have a coordinated Government with one economic philosophy going ahead. Then you will be successful. All I can say to you is that my frustrations have lasted longer than yours only because I have been here a little longer.

Mr. HANNAFORD. It occurs to me if we are going to enshrine this thing, put the whole thing in one basket and let the Fed make the decisions regarding both fiscal and monetary policy. To give one to us and the other to them without ever having the twains meet is counterproductive.

Mr. ADAMS. Maybe at some point we will run the Government by experts as opposed to elected representatives. I hope that is far in the future. I have seen some experts in 1965 make some horrendous mistakes. I am not over-awed by expertise.

Mr. HANNAFORD. I was saying that in jest. If we are going to do the wrong thing, we should be at least doing it consistently.

Mr. NEAL. If you could set monetary policy for next year, what would it be? What would the money growth figure be?

Mr. ADAMS. I would go with a short-term bill rate of 5.5 percent average. I would anticipate an inflationary rate of 5 percent, maybe

a little bit less. If speculation began to reoccur in the financial community of volume that occurred in 1974, I would make threatening noises. I would come to the Hill for support on those threatening noises so we used coordinated policies against the spot inflation. My point is there is no point in panicking and trying to raise interest rates. I would try to maintain them on a constant level. We are coming out of a recession and there is no reason to crunch the money supply now.

Mr. NEAL. Would you go over the Fed's upper money growth bound of 7 percent?

Mr. ADAMS. No. If it happened for a month or two, I would not panic. I would first determine where the velocity problem was occurring and operate on that specifically before I used the blunt instrument of increased interest rates.

Mr. NEAL. Are there any further questions?

Mr. ADAMS. I thank you, Mr. Chairman, for inviting me this morning.

Mr. NEAL. Thank you very much.

The subcommittee stands adjourned until tomorrow morning at 10 a.m., when we will continue our hearings in this same room.

[Whereupon, at 11:20 a.m., the subcommittee adjourned, to reconvene at 10 a.m. Wednesday, June 9, 1976.]

THE IMPACT OF THE FEDERAL RESERVE'S MONEY POLICIES ON THE ECONOMY

WEDNESDAY, JUNE 9, 1976

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON DOMESTIC MONETARY POLICY
OF THE COMMITTEE ON BANKING, CURRENCY AND HOUSING,
Washington, D.C.

The subcommittee met pursuant to notice, at 10:20 a.m., in room 2128, Rayburn House Office Building, Hon. Stephen L. Neal [chairman of the subcommittee], presiding.

Present: Representatives Neal, Hannaford, Allen, and Hansen.

Also present: Dr. Robert Weintraub.

Mr. NEAL. Gentlemen, I would like to thank you all for coming this morning. The House is in session, but hopefully we will have a minimum of quorum calls and be able to proceed in an orderly way.

This morning we are continuing our hearings on the impact of the Federal Reserve's money policies on the economy. As I stated yesterday, I will again say that the functions of the Federal Reserve System and its Open Market Committee, which decides the Nation's money policies, remain a mystery to many people.

Most Americans do not know how important money policy is to the prices of the goods they buy, the interest rates they pay, their job opportunities, wages and profits.

The hearings are intended to cover several specific points which include:

One: How money policy affects the cost of living.

Two: How it affects production and employment.

Three: How interest rates are affected by money supply changes, both directly and through changes in prices, production and employment.

Four: How government spending and tax policies affect money policy and their relationships to prices, interest rates, production and employment, and,

Five: Whether Congress should set goals for economic growth, unemployment, inflation and interest rate levels and require the Federal Reserve to promote achieving these goals.

In preparation for these hearings, I have asked the staff to compile statistical data on our economy's performance and the growth of money supply, and the level of Federal Government surpluses or deficits since 1954.

This work is going forward. To date it has centered on how money growth and Federal deficits have affected the rate of inflation and the frequency of recessions.

We have prepared an exhibit to bring these relationships into focus. As our exhibit shows, the rate of growth of money supply has followed a roller-coaster pattern, which tilted upward after 1964. As a result, we have suffered periodic recessions; and since 1964 they have been imposed on waves of inflation.

Our exhibit maps the relationship between inflation measured from one month one year to the same month the next year, to money growth also measured over 12-month periods, but occurring 23 months earlier.

The relationship between inflation and money growth was mapped with a 23-month lag because it takes time for changes in money supply to affect the inflation rate; and the staff found, using computer studies, that the effect of increases or decreases in money supply on the rate of inflation peak after approximately 23 months.

As the exhibit indicates, the rate of inflation rises and falls in the wake of increases and decreases in the growth of money. About 60 percent of our inflation can be explained by changes in money growth occurring 23 months earlier. And this, let me emphasize, holds as much, perhaps even more, for the seventies as for the fifties and sixties.

The exhibit also shows that each time our economy experienced a recession since 1954, it occurred after the Fed moved to sharply decrease the growth of money supply. Finally, the exhibit maps the relationships between recessions, inflation and money supply and Federal deficits. In this regard, the conclusion that emerges is that the impact of deficits on the inflation rate and recession is weak as compared to that of money growth.

While the subcommittee will refine its work in these areas, the staff also is studying the relationships involving unemployment and interest rates. In addition, we are endeavoring to ascertain the impact of money supply on the economy by simulations of large econometric models using different money growth patterns. Preliminary results from these runs indicate, among other things, that the economy is far more tolerant of interest rate fluctuations than it is of money supply gyrations.

We hope that the results of our work will produce a better understanding of the ways our economy is affected by Federal Reserve policies and promote the use of responsible guidelines for coordinating monetary and fiscal policies.

This morning we will hear from four very distinguished witnesses:

Edgar R. Fiedler, who is the vice president of economic research, general, at the National Industrial Conference Board; Jerry L. Jordan, who is vice president and chief economist of the Pittsburgh National Bank; David I. Meiselman, professor of economics at the Virginia Polytechnic Institute; and George Perry, senior fellow at Brookings Institution.

I would like for you all to proceed in any way with which you are comfortable. If we could, it would be helpful to try to keep your remarks under 10 minutes or so, so we can leave some time for some discussion.

At this time I would like to recognize Mr. Fiedler.

STATEMENT OF EDGAR R. FIEDLER, VICE PRESIDENT, ECONOMIC RESEARCH, GENERAL, THE NATIONAL INDUSTRIAL CONFERENCE BOARD

Mr. FIEDLER. I am pleased to be here and have a chance to participate in these hearings. I can summarize the full statement which is available for the record. I can summarize some of the major points fairly quickly.

Mr. NEAL. We will insert your statement in its entirety in the record.

Mr. FIEDLER. Thank you, sir.

The economy is in a moment of cyclical tranquility. We are past the last effects of the recession and everybody now recognizes there is a recovery in process but we are not yet in the later stages of prosperity, and the later stages of the business cycle where some of the distortions come into view.

We are betwixt and between. We still have a below average rate of resource utilization in the economy. The key analytical aspect of this is how much capacity there is in the economy. We run into trouble immediately with the analytics and the measurement here because capacity is one of the slipperiest concepts and measurement problems we have in economics.

Most people think of how much room there is to grow in the economy simply by looking at the unemployment rate. Certainly the labor markets are one of the key dimensions of the economy, of how much capacity there is, but only one of several dimensions. At this point it seems to me, in this particular series of years that we are in now, the key dimension of capacity is the productive facilities available to process raw materials, the first processing of raw materials: steel, nonferrous metal, basic chemicals, paper and so forth.

This is where we ran into the bottlenecks in 1973-74. This is also where we are now closest to full utilization of our resources. If we run into the limits of capacity in this cycle sometime in the year or two coming up, it will not be in the labor markets, it will not be in the advance processing industries, it will be in those major materials industries.

My guess is given the vigorous recovery that I expect to continue, we have about another year, maybe 18 months, before we hit the limits of capacity to expand.

I claim no expertise. Not much exists. I labeled this in my statement as a guess but it is my best guess. It is too important an issue to ignore. If that judgment is correct, given the lags in monetary policy, we would have some possibility of applying a more stimulative monetary policy for the short run to obtain a more rapid growth of economic activity and put more people back on the payroll sooner.

That would be a respectable bit of advice. I would like to express a couple of points of caution about that idea, however. One is that a faster rate of growth in monetary expansion now would imply that rather soon given the lags again, we would have to cut back even further on it.

This kind of scenario, experience suggests to me, has given us a lot of trouble in the past. It is what economists have come to call "fine tuning" of monetary policy and it implies an ability to forecast and a delicate touch on the monetary policy levers that is probably beyond our ability to handle.

It also suggests that it won't be very long if you raise the rate of monetary expansion now, temporarily, before you would have to make an abrupt downward adjustment and that would raise questions and uncertainties about the possibility of that leading into a recession. So here, I believe, these kinds of considerations lead me to suggest caution on this idea of adding more monetary stimulus at the present time.

Second, we have our shortrun goals of fostering as vigorous a recovery as we possibly can. We have a longrun goal of reducing inflation, which is still high by historical standards. The longrun goal calls for the opposite prescription for policy, namely reducing the rate of monetary expansion.

There is no way to reconcile the two prescriptions instantly and automatically. In the past we have paid too little attention to the longrun goals and we ought to give them at least equal weight, and this, too, argues for caution.

I would like to add one more point about capacity. The fact that we run out of capacity in terms of the major materials industries indicates an imbalance between capital facilities available in our economy and the labor. In other words, when we hit the limits of our ability to expand and we still have an unemployment rate high by historical standards. This argues in my mind for policies—not necessarily monetary policies though they could play a role—policies that will foster a vigorous expansion in capital formation so we can avoid hitting those bottlenecks at too early a point in terms of unemployment.

When we get to prosperity we ought to shoot for a balance between the capital facilities and the labor facilities so everything is fully utilized as is consistent with a smoothly operating, efficiently operating economy. If you have to have an imbalance, however, it ought to be the opposite way. We ought to have idle machines and not idle men.

This argues strongly for some kind of policies, incentives for saving and investment over the next few years. This is not a shortrun, this-year, next-year policy suggestion. It is for the long run: 5, 10, 15 years.

Finally, I would like to make a comment about the relationship between fiscal and monetary policy. In my statement there is a table I would like to refer to.

It points to what I would regard as the divergence between the relative status of fiscal policy and monetary policy at the present time. Normally, I think it is fair to say, fiscal and monetary policy usually point in generally the same direction.

In 1972 both were overly stimulative. At the present time, however, it seems to me we have a divergence with fiscal policy relatively more expansive, monetary policy more moderate. The table shows monetary policy—that the Federal Reserve target growth rate for the narrowly defined money supply, M_1 , 6 percent.

I would compare that with 1972, also the second year of a business cycle recovery, where the growth in the narrowly defined money supply was over 9 percent.

The Federal Reserve's target for policy at this time is therefore clearly more cautious than it was in 1972. If one were to take account of the fact that the base rate of inflation that is built into the system

at the present time is a couple of percentage points higher than it was back in 1972, that suggests an even more striking comparison in those terms that our monetary policy is now more restrictive, more cautious, more moderate than it was in 1972—and I would regard 1972 as having been a vigorous, stimulative policy.

Fiscal policy is a different story. If we look at fiscal 1976 and 1977, we have budget deficits estimated at 4.7 and 2.8 percent of GNP respectively for those 2 years. Back in fiscal 1972 and 1973 we had deficits of 2.1 and 1.2 percent.

I am sure there is not a perfect relationship or a perfect parallelism between 1972 and 1976 but I believe that in a general way it is an appropriate comparison. I regard fiscal policy as too stimulative in 1972. It is more stimulative now. Here we have monetary policy more constrained and fiscal policy more stimulative. There is a serious divergence between the two.

It raises some questions, more than I have answers for, but the questions are nevertheless interesting. As long as this divergence lasts, it suggests that we will have some upward pressures on interest rates, particularly short term rates, which are always unsettling to the economy in general.

Second, we have the question of whether this divergence can last indefinitely. I doubt that it can. Then we have to figure out whether the reconciliation between fiscal and monetary policy is going to take place with both of them coming together in a compromise or whether it involves a more expansive monetary policy to fall into line with fiscal policy, which would raise questions about a new outbreak of inflation and all the problems of a boom or an excessive boom of economic activity a year or two or three down the road, or in turn whether fiscal policy pulls back, becomes more cautious and gets into line with monetary policy.

This would raise questions in people's minds about the expansion for the next year or two. I don't know if there is any way to decide specifically that one way is appropriate and the other is not to reconcile this divergence of policies.

But it seems to me to be an interesting question and raises a lot of uncertainties about the next few years. I think that is all the summary I need to give you. We can go into any other parts of the statement later as you wish, Mr. Chairman.

[Mr. Fiedler's prepared statement follows:]

PREPARED STATEMENT OF EDGAR R. FIEDLER, VICE PRESIDENT, ECONOMIC RESEARCH, THE CONFERENCE BOARD

This Subcommittee is studying some of the most fundamentally important, the most interesting and the most difficult issues of economic policy, and I am glad to have an opportunity to participate.

The main focus of this investigation, the impact of monetary policy on economic activity and inflation, is an extraordinarily complex matter about which our understanding is very imprecise and incomplete. One of the few aspects of this topic that seems reasonably well established is the long-term relationship between monetary growth and inflation. In the very long run, say a decade or two, the growth of money is clearly the dominant factor determining the rate of inflation; the faster money increases, relative to total economic output, the faster prices will rise. This association is not perfect for all times and all places and there is some uncertainty about the precise definition of money, but by and large the long run relationship between money growth and inflation is impressively close and consistent.

At the same time, although perhaps this is not so well established, there appears to be very little long-run relationship between money growth and economic activity.

In the short run, however—say one to two years—monetary policy has a significant impact on both inflation and economic activity, but in varying and highly uncertain proportions. I have no doubt that the effect of an expansionary monetary policy on real activity is more pronounced (and the effect on inflation less pronounced) when resource utilization in the economy is, as now, below average. But I have great doubts that anyone can tell you the extent to which that is true. How much impact monetary policy will have on output vs. inflation depends on many factors including, importantly, the state of peoples' expectations about the economy. Consequently, how much additional output would be generated by a more stimulative monetary policy in the near term, as against how much additional inflation, is a highly uncertain proposition.

If the short run were all we had to worry about, the low current rate of resource utilization in the economy would surely tempt us to recommend a more rapid growth of money on the expectation that it would speed up economic expansion, and in particular put more workers back on the payrolls sooner, at an acceptably moderate risk of exacerbating inflation.

There are, however, two points that must be raised about such a policy move. First, it is not enough simply to demonstrate that a low rate of resource utilization exists currently. It is also necessary, because of the significant lags in the implementation and impact of policy shifts, to be persuaded that the economy will still require an additional boost about a year ahead. For this purpose a series of forecasts are needed: forecasts of the level of economic activity and how fast it will be expanding at that time, and also forecasts of the total capacity of the economy and how fast capacity will be expanding.

Here, too, we run into great analytical uncertainty. What constitutes economic capacity is very difficult to conceptualize and even more difficult to measure.

Most people, when they think about the limits of capacity and how much room there is left in the economy for continued expansion, tend to think of this question only in terms of the unemployment rate. With 7.3 percent unemployment at present and with the labor force expanding by 1.5-2 percent per year, it seems rather obvious that the economy has plenty of room to grow.

However, the labor markets represent only one dimension of our economic capacity—a very important dimension, but only one of several. The key dimension these days appears to be in the materials processing industries—steel, nonferrous metals, paper, basic chemicals, and other industrial materials. This was the sector where the U.S. economy, indeed the entire world economy, ran into the limits of its ability to expand in 1973-74, and where we are most likely to do so again in the current cyclical upswing. If we are destined for another collision with capacity in the present cycle, it is not likely to come in the labor markets, or in the financial markets, or in the advanced processing industries; it is likely, rather, to take the form of a new round of shortages and bottlenecks and price pressures in the major materials industries.

There is already some talk that we are now closing in on full capacity operations in paper, steel and chemicals, and will reach our productive limits before the year is out. My own guess (I make no claim to expertise, but there isn't much of it around) is that with a few bearable exceptions there is probably enough materials processing capacity to support a continued cyclical upswing in the economy for twelve to eighteen months more.

If that be an accurate judgment, it suggests that there might be a little room for additional near-term monetary stimulus without taking too much risk of accelerating inflation, but not very much. Indeed, it appears that the capacity limits of the economy (focused in the major materials industries) are close enough that we will soon have to be thinking in terms of slowing down the cyclical expansion to something approximating a normal long-run rate of growth.

Before leaving this discussion of capacity, there is one further aspect of it that needs to be emphasized. The fact that the limiting element in our economic expansion is the major materials industries means that we have a serious imbalance between capital and labor. That is, we reach our capacity limits when the unemployment rate is still significantly higher than it would otherwise have to be, which is a terrible human cost. For this reason, I believe it is of the utmost importance to redress the balance between capital and labor by fostering a rapid expansion of new capital formation, especially in the materials industries. Hopefully, then, in the next round of prosperity when the next cyclical expansion reaches

full capacity, the limiting factor will be the availability of labor rather than the availability of capital facilities. If there are any productive resources that must remain idle during prosperity, let them be idle machines rather than idle workers.

LONG-RANGE GOALS

But to return to the hypothesis I put forth earlier that a more rapid growth of money in the near term might add to economic expansion without adding very much to the inflation rate, there is a second point to be raised, namely, that we cannot ignore our long-range economic goals. A primary long-term goal is to help create a prosperous noninflationary economy by gradually reducing the growth of money to a rate consistent with the long-run growth of physical economic output. The policy prescription for this goal is thus just the opposite of the policy prescription (more monetary stimulus) called for by our primary short-run goal of fostering vigorous economic recovery.

In the past we have consistently given a very low priority to this long-term objective. Indeed, we ignored it almost entirely on occasions. The result was severe, persistent, unyielding inflation. In the process we failed completely to achieve sustainable prosperity. Instead, the inflation was accompanied by the familiar boom-bust rollercoaster for economic activity. In the future, I hope we can give due consideration simultaneously to both near and more distant goals.

Some economists would argue in this situation for a "fine tuning" of monetary policy: temporarily increase the rate of monetary expansion now, and then reduce it even farther a little later. Under ideal circumstances, this might be a respectable scenario, but past history strongly suggests it would require a forecasting accuracy and a delicate touch on the policy levers that are beyond our abilities. In addition, such a process would seem to require at some not too distant point a significant tightening of monetary policy on a fairly abrupt schedule that would seriously raise the spectre of recession. In other words, although the idea would be to gently brake the momentum of expansion down to a sustainable rate, the process would run a serious risk of breaking the expansion altogether.

POLICY COORDINATION

Another important issue that is worth discussing is the relationship between fiscal policy and monetary policy. Most of the time the two operate in tandem; both tend to be stimulative together, or neutral, or restrictive. On occasions, however, the fiscal and monetary policy positions diverge significantly for a time, although because there is no common denominator for measuring both of them it is not always easy to recognize such a development on a current basis.

I suspect that a divergence of policies is now taking place, with fiscal policy relatively expansive and monetary policy decidedly more moderate. To illustrate this divergence, it is useful to compare 1976 with 1972, which was also the second year of a business cycle upswing. I believe many economists would agree that both fiscal and monetary policy were rather stimulative in 1972, perhaps (as is my view) too much so. (It might be argued that 1976 and 1972 are not quite comparable in that the economy in 1976 is at a somewhat lower level of resource utilization than in 1972. While there may be some validity to that argument, I believe there is more similarity than difference, and thus that the comparison of policies for the two years is an appropriate one.)

	FRB target, calendar 1976 midpoints		Calendar 1972	
	M-1 growth	M-2 growth	M-1 growth	M-2 growth
Monetary policy (percent)	6	9	9.2	11.4
	Unified budget deficits as a percent of GNP, fiscal year—			
	1976	1977	1972	1973
Fiscal policy	4.7	2.8	2.1	1.2

The 1976 target growth rates for money, either narrowly or broadly defined, are 2½–3 percentage points below the 1972 experience. Thus monetary policy is clearly less expansive this year (assuming the targets are met) than it was in 1972.

Furthermore, this comparison is even more striking if one takes account of the fact that the rate of inflation is a couple of percentage points higher in 1976 than in 1972.

On the other hand, with budget deficits equal to 4.7 percent of GNP in fiscal 1976 and 2.8 percent in fiscal 1977, compared to 2.1 percent in fiscal 1972 and 1.2 percent in fiscal 1973, fiscal policy is much more stimulative at the present time than it was four years ago.

This divergence of the stance of fiscal policy from monetary policy raises several interesting questions. For one thing, as long as the divergence continues, it suggests upward pressures on interest rates, especially short-term rates. Another question is whether these divergent policy positions can continue very long. Historically, that has not happened; after a time one policy has adjusted to be consistent with the other. If, in the present circumstances, fiscal policy were to adjust to monetary policy by moving toward significantly less stimulus, serious questions would be raised about the vigor of the business uptrend. On the other side, if monetary policy were to become substantially easier, to conform more closely to the present position of the budget, fears of a new acceleration of inflation would be generated. Thus any reconciliation of the two divergent positions is sure to raise many economic doubts and uncertainties.

CONCLUDING REMARKS

Throughout this discussion I have stressed the limitations of economic forecasting, the shortcomings of analysis, and the difficulties of implementing monetary policy in a precise and ideal way. That is, I believe, an appropriate emphasis.

In expressing these doubts, however, I trust I will not be misinterpreted. I do so not out of any belief that monetary policy is ineffective or otherwise doomed to failure, but rather in the hope of imparting some realism to our expectations about what monetary policy can achieve. Policy makers, politicians and economists have all oversold both fiscal and monetary policy during the past couple of decades. I would hope we can correct that situation. I would hope we can understand that there are no easy answers.

Let us use our monetary and fiscal tools vigorously. But let us use them with care. Most important, let us use them with a proper understanding of both their value and their limitations.

Mr. NEAL. Thank you very much indeed, Mr. Fiedler. Mr. Jordan?

Mr. JORDAN. Thank you, Mr. Chairman.

Mr. NEAL. Well, why don't you let us catch this vote?

We will be back shortly.

[Voting recess.]

Mr. NEAL. What we have been trying to do here—and I want to make this clear to all of you and to anyone else interested in this hearing—is to start by asking questions about the economy with no preconceptions about what has been right or not and let the facts unfold as they are, so we might objectively understand what has been going on in our economy.

This chart is a result of asking those kinds of questions. It is preliminary. We would very much appreciate you all at the appropriate time looking at it and seeing if you see any problems with it at this point. See if you think we are painting a picture of these relationships that does not exist. (See exhibit 1 and overlays A-C, pages 3-4.)

If you see any flaw, please let us know. It would be helpful to us if all of you would examine the exhibit and give us your suggestions. Let's go on now and at this point hear from Mr. Jordan.

STATEMENT OF JERRY L. JORDAN, VICE PRESIDENT AND CHIEF ECONOMIST, PITTSBURGH NATIONAL BANK

Mr. JORDAN. Thank you, Mr. Chairman. I will not read my statement. I appreciate this opportunity to give my views on the conduct of monetary policy since it is now at the center of the debate about

appropriate stabilization policies for dealing with our inflation problem and unemployment at the same time.

Now, in contrast to a decade ago, most economists acknowledge that monetary policy is important. It is my view that the growth rate of the money supply is the most reliable indicator of the thrust of monetary policy actions. There is still a large number of economists who emphasize interest rates, and in public discussions it is generally held that the level of interest rates is still a very important measure of the tightness or ease of monetary policy. I want to address specifically that point.

In my view, interest rates can be a misleading indicator. In recent weeks, the rise in interest rates that we have seen in the short-term money markets has led some people to say that the Fed is tightening policy prematurely. I don't think that is correct. I think the sharp acceleration in monetary growth that we have had at the same time is an indication of an expansionary policy—not a more restrictive policy—in spite of the rise in interest rates. I don't think monetary policy should be viewed as a choice between high interest rates and rapid money growth, or between slow money growth and low interest rates. You have to set targets for the future in order to have the interest rates you want in the future.

Before discussing this relation further, I want to comment on the relationships between the money supply, inflation, output, and unemployment. I have brought a few charts to illustrate the basic relationships.

The basic analysis is that fluctuations in the growth of the money supply are related to fluctuations in output and unemployment, and the trend growth of the money supply determines the trend of prices or inflation.

The heavy, solid line in the top tier of chart I¹ shows the growth rate of the narrowly defined money stock, M_1 , over two quarters or 6-month periods. The fine line is the average growth in money over 5-year periods. The second tier on the chart shows the average growth of prices over 5-year periods. The third tier shows the fluctuations in output over two quarters. The gray shaded areas are the recession periods when real output declined. On the third tier, you see that real output contracted sharply and unemployment rose sharply during recessions. The contraction in money growth shown at the top [the decline in the dark, heavy line] coincided with contractions in real output growth, precipitating the recessions.

The continuing rise in the trend growth of money over the sixties and seventies has been accompanied by a rise in the trend of inflation. Now we have an average growth of the money supply of about 6 percent, so we have an average inflation that seems to be built into the economy in the range of 5 to 6 percent.

Some economists are arguing that we should have twice as rapid growth in money as the Fed wants, maybe 10 or 12 percent. That would raise the solid line at the end of the top tier on the chart up off the top of the chart. Once that has occurred, the Fed would be faced with two choices at the end of this year or going into 1977. If high growth in money is maintained, the trend will rise and that will raise the trend of inflation. But if money growth is contracte., you

¹ The chart referred to may be found at the end of Mr. Jordan's prepared statement.

are going to precipitate a recession. The only time you can fight recession is during the previous expansion. To me, money is sort of like a narcotic—the economy can get hooked on too much of it and if it does, it has got to face going through withdrawal symptoms eventually.

Let's look at chart II,¹ the relationship between inflation and interest rates. The top line is simply a series of high quality corporate bonds. The lower line is the average rate of inflation over a 5-year period, similar to the second tier on the first chart. The idea is that there is an inflation premium in market interest rates, there is a real yield—a real return on capital and people's savings after taking account of inflation. Borrowers are willing to pay a premium for what they expect inflation to be, and lenders are demanding it in order to compensate them for inflation.

Some people would like to see a decline in the long-term bond yield in order to encourage capital expansion or growth in investment, and maybe a stronger housing market. It is tempting to try to push interest rates down to help the economy. My point is, it would be self-defeating because investors in the market would look at the rapid growth of the money supply and would expect future inflation to be higher, and they would try to protect themselves from the losses in capital markets that would accompany another round of accelerating inflation and rising interest rates. They would invest in short-term assets. They would avoid long-term commitments. Long-term interest rates would rise. You would get rates rising, not declining. The only way I think we are going to get lower long-term interest rates is simply to wait it out until we get an average rate of inflation down to something much lower than seems to be built in. The 8- to 9-percent level of long-term interest rates implies the markets expect about a 5- to 6-percent rate of inflation, and only when they can expect a lower rate of inflation than that can we expect to get a decline in interest rates.

Short-term interest rates are shown on chart III.¹ I think that chart speaks for itself. The solid line is the interest rate, the prime commercial paper, a series I picked to illustrate a relationship. The dotted line is the rate of inflation. It shows how the market responds to inflation in the short run.

Mr. NEAL. May I interrupt you? Can we pick up on this chart when we return? We have to make it to the vote.

Mr. JORDAN. Yes.

[Voting recess.]

Mr. NEAL. Mr. Jordan?

Mr. JORDAN. Thank you, Mr. Chairman. Let me proceed in the following way. Suppose the Federal Reserve achieves its targets for the growth rate of the money supply, what can be expected, and what sort of alternatives are there and what would they imply? If they do not exceed their midpoints for growth of the money supply, we will have a durable, healthy growth in real output, and a further decline in the unemployment rate. Growth in total employment has been stronger than people would have believed, and the unemployment rate has declined more than most people would have expected.

¹ The chart referred to may be found at the end of Mr. Jordan's prepared statement.

We can continue to see that kind of development. If so, then we also would not expect a reacceleration in inflation nor a rise in long-term interest rates.

Mr. NEAL. I am sorry. If what?

Mr. JORDAN. If the Federal Reserve does not exceed the midpoints for its money supply growth targets. In the past, we have seen rapid monetary growth in an election year followed by a year of more restrictive policy—slower money growth and higher interest rates. We can and should avoid that kind of pattern.

However, if the economy continues to strengthen, you are going to have upward pressure on short-term interest rates. They will rise toward the level of long-term rates. This is a natural, cyclical phenomenon. It should not be resisted by rapid money growth.

The alternative is not to expand money rapidly to hold interest rates down until we get full employment. The alternative would be to hold it down this year, and pay the price next year. I think that can and should be avoided.

Let me turn to congressional oversight. Concurrent Resolution 133 is a valuable contribution to monetary policy. Oversight by Congress of monetary policy is desirable. But I do think there are dangers of excessive involvement in the formulation and implementation of policy. The primary role should be to maintain the checks and balances that are inherent in the whole political system.

Certainly the Federal Reserve should be held accountable for their actions. Congress should scrutinize the actions of monetary policy to insure that they are not used to achieve short-term political gain. But, there is a risk of asking too much from monetary policy—asking more than it can deliver in terms of offsetting the mistakes inherited from others, or trying to correct for some of the real shocks to the economy, such as agriculture, quadrupling of oil prices, and some other things.

You can ask the monetary policy actions not be destabilizing as they have been in the past. They have caused worse recessions and more unemployment than we otherwise would have had. I think it is possible to avoid destabilizing actions and Congress should use its oversight to hold the Fed accountable on that ground.

Two things that oversight can do. It can insure that monetary policy actions promote conditions of stability to minimize the uncertainty in the markets so the real economy can adjust most easily and rapidly to its natural full employment, full capacity state. They can prevent the accelerations and decelerations that have occurred in the past that have caused credit crunches and waves of higher interest rates.

There are two objectives in setting money targets that the Federal Reserve should be held to. One is to gradually lower the trend growth of money so you lower the rate of inflation, and the other is to eliminate the fluctuations in money growth so that it does not contribute to fluctuations in unemployment that occur.

Thank you.

[The prepared statement of Mr. Jordan, along with the charts referred to, follows:]

DOMESTIC MONETARY POLICY

Testimony By

Jerry L. Jordan
Vice President & Chief Economist
Pittsburgh National Bank

Mr. Chairman and members of the Sub-Committee:

I am pleased to have this opportunity to present my views on the conduct of monetary policy, and how it affects production, employment, and the cost of living.

The conduct of monetary policy, and especially the growth rates of the nation's money supply, has moved to the center of the debate about appropriate stabilization policy actions at a time of simultaneous inflation and high unemployment. Even economists who have spent much of their careers arguing that monetary policy was not important, and that especially the money supply was irrelevant, are now advocating specific growth rates of money supply in the present circumstances. It appears safe to conclude that we have established that "money matters" and all that we are doing is haggling over the growth rates.

However, the role of interest rates remains very much an issue among economists as well as in public discussions. Let me state at the outset that I am one who finds it most

useful to gauge the stimulus or restraint emanating from monetary policy actions by the growth rate of the money supply. There is substantial evidence, both in the U.S. experience and around the world, that the level of market interest rates can be a false indicator of the tightness or ease of monetary policy.

Yet, in recent weeks, some members of the economics profession have cited the rise in short-term market interest rates as an indication of a move by the Fed towards "tight money" even though there has been a pronounced acceleration in the growth rate of money supply. In a few moments I will elaborate on my view that monetary policy actions should not be viewed as a choice involving rapid money growth versus high interest rates, nor slow money growth versus low interest rates. But first I will direct my attention to the relation between monetary policy and inflation, production, and employment.

I draw your attention to Chart I. One of the cornerstone propositions of monetary analysis is that fluctuations in the growth of the money stock around its underlying trend result in fluctuations in output and employment, whereas the trend growth of the money stock determines the trend growth of prices. A substantial body of empirical evidence has demonstrated repeatedly that an acceleration in the growth of the money stock initially will have an expansionary effect on output and employment, but, subsequently, prices will begin to rise (over an extended period of time)

as the trend growth of money also rises. The corollary is that a contraction in the growth rate of the money stock relative to its trend will result in a contraction in the growth of output and employment.

The heavier line on the top tier of Chart I is the growth rate of the money stock over a two-quarter or six-month interval, while the trend line is the average rate of increase of money over a five-year period. The second tier shows the rate of increase of the GNP implicit price deflator over a five-year period and the third tier shows fluctuations in the growth of real output over two-quarter periods. The basic point is that fluctuations in money growth around the underlying trend, as shown in the top tier, are reflected in fluctuations in real output. The average rate of inflation reflects the trend growth of the money stock.

The average growth in the money supply in recent years has been around 6 percent. The center of the Federal Open Market Committee's target growth for M1 is also about 6 percent and, therefore, is a policy of returning to and maintaining the prevailing trend growth of money over the next year. As long as that policy is continued, something around a 5 to 6 percent average rate of inflation should be expected. In order to make progress towards further reducing the rate of inflation, it will be necessary to gradually reduce the trend growth rate of the money supply. Ultimately, if we are to ever return to the rate of inflation

that prevailed on balance in the 1950s and early 1960s, it will be necessary to reduce the trend growth of the narrow definition of the money stock to only about 2 percent.

However, the immediate problem in pursuing that objective is that there is still an unacceptably high rate of unemployment in the economy, and there is every reason to expect that the strengthening credit demands that will occur as the recovery continues will produce upward pressure on short-term market interest rates. Because of this, there are economists who advocate increasing the money stock twice as rapidly as the announced targets of the Federal Reserve (if necessary) in order to prevent increases in market interest rates before a much lower rate of unemployment is achieved.

It is my view that if the Federal Reserve were to allow the money supply to increase at a 10 to 12 percent rate the balance of this year, in order to prevent interest rate increases and to promote a higher level of employment and capacity utilization, they would be left with a very unpleasant dilemma next year. The pursuit of "low interest rate policies" would prove to be self-defeating. At some point the monetary authorities would be faced with two choices. They could sustain those extremely high growth rates, but that would raise the trend and cause quite high rates of inflation. Or they could produce a marked contraction in the growth of money as we approached a higher level of resource utilization which, in turn, would necessitate an economic contraction.

In other words, if a low interest rate policy were to result in double digit money growth for the balance of this year, then we would be faced with either double digit inflation or another credit crunch and major recession within two to three years. This paradox of low interest rate policies resulting in high interest rates stems from the fact that inflation and high market interest rates are both a product of excessive monetary growth.

It is a myth that rapid money growth can maintain low interest rates, except in the very short run. The reason Switzerland has low interest rates is because they have had moderate money growth. The reason Brazil has high interest rates is because they have had rapid monetary growth.

Chart II shows the yield on high-quality corporate bonds plotted along with the average rate of inflation over a five-year period. Most people accept the idea that the level of long-term interest rates includes some "premium" for the average rate of inflation that is expected to prevail over the life of the bond. Lenders demand compensation for the erosion in purchasing power that takes place when there is inflation, and borrowers are willing to pay the premium because they are aware they will pay off their debts with "cheaper dollars."

The prevailing level of long-term bond yields reflects expectations of about an average 5 to 6 percent rate of inflation in the future. There is no reason to expect long-term interest rates to decline until there is reason to

believe that inflation will be less than the 5 to 6 percent that seems to be the consensus view. It is tempting to seek a more rapid decline in long-term interest rates in order to foster conditions conducive to increased private investment and lower mortgage rates to stimulate housing demand. However, to the extent that investors pay attention to the growth rate of the money supply in forming their expectations about future inflation, policy actions by the Federal Reserve that resulted in sharply higher growth rates in the money supply would cause long-term interest rates to rise, rather than fall. This is because managers of investment funds would attempt to avoid incurring a capital loss that would occur when the price of long-term bonds declined as the inflation premium in bond yields was revised upwards. The precautionary actions by investors in the money and capital markets would thwart actions of the central bank designed to aggressively push interest rates down.

Turning to short-term market interest rates, Chart III shows the relation between the average rate of inflation over six-month periods and the short-term commercial paper rate. I think that the chart speaks for itself. The way to avoid a return to the level of short-term interest rates that was reached in 1974 is to avoid the kind of acceleration in inflation that occurred at that time. This leads us back to the role of monetary policy in avoiding another inflationary outburst.

It is useful to distinguish between inflation as an ongoing process, and a change in the price of one or more commodities or a one-time increase in the average level of prices. A continuous inflation is the result of aggregate demand rising more rapidly than aggregate supply over a prolonged period of time. That development usually has occurred as a result of the growth of the nation's money supply being excessive so that we have a case of "too much money chasing too few goods."

Some economists argue that the high rate of unemployment and low rate of capacity utilization indicates that there is no danger of a spill-over of excess demand into renewed inflation in the immediate future. I disagree with them on the grounds that the economically usable capacity is smaller than the capacity utilization or potential GNP data indicate. Most people attribute a large share of the economic problems of the past few years to the following factors: the major crop failures in 1972 and 1974, the two devaluations of the dollar, the after-effects of wage and price decontrol, the increased production costs associated with devoting a greater proportion of our resources towards cleaning up our environment, the production of safer products and providing an improved environment for workers, and the very pervasive effects of the quadrupling of the price of petroleum energy. These forces resulted in a loss of wealth and a decline in the real economic capacity in our economy and a temporary bulge in the rate of inflation. I am suggesting

that the major initial forces contributing to the long and deep recession were shocks to the supply side of the economy that left us with both a higher level of prices and a lower real output potential. Consequently, the dangers of reigniting inflationary pressures are much greater than conventional measures of economic capacity might suggest.

There is no doubt in my mind that if the growth in the money supply does not exceed the mid-points of the target ranges announced by the Federal Reserve, a healthy, durable economic recovery will continue and renewed inflationary pressures will be avoided. However, as a natural cyclical phenomenon, short-term market interest rates will rise as strengthening private sector credit demands compete with government borrowing. But it would be a mistake to interpret the rising short-term interest rates as a sign of restrictive monetary policy at a time when the quantity of money is also increasing at a historically high trend rate.

The alternative to a natural rise of short-term interest rates of as much as 2 or 3 percentage points over the next year is not to simply hold them down through more rapid monetary growth. The alternative is to artificially suppress the level of short-term interest rates during 1976 through excessively easy policies, and then pay the price in 1977 and 1978 in terms of even higher interest rates and eventually another credit crunch and recession.

Congressional Oversight of Monetary Policy

I believe that Concurrent Resolution 133 has made a desirable contribution to the monetary policy process. However, I also believe that former Congressman and Speaker of the House, Sam Rayburn, was correct in warning of the dangers of excessive Congressional involvement in the formulation and implementation of monetary policy actions.

I would think that one of the primary roles of Congressional oversight of the Federal Reserve would be to maintain the checks and balances that have been a central ingredient of our entire system of government and were very much a part of the Congressional deliberations that created the Federal Reserve over sixty years ago. Our independent and decentralized system of Reserve Banks has served us very well, and the safeguards against potential abuse of power to create money must be preserved.

It seems that Congress would want to scrutinize actions of the Federal Reserve to insure that monetary policy actions are not used to achieve short-term political gain. I would not want to see members of the Federal Open Market Committee adopt policies designed to achieve political objectives either of their own choosing or as a result of pressure from the executive branch, the legislative branch of government, or other political groups.

Regarding the setting of economic goals, I think that the Federal Reserve should promote conditions conducive to full employment, minimum inflation, and low interest

rates. And I think that every member of the Federal Open Market Committee and every professional economist, as well as the general public, would agree. But disagreement would arise over the weighting to be assigned to each objective in the near term, and the time frame in which the goals are to be pursued, as well as the tools and techniques that are to be employed.

There is a risk of asking more of monetary policy than it can deliver. I believe that a market-oriented economic system is naturally resilient and inherently stable at a high rate of capacity utilization, including full employment of labor. But the system is frequently subject to destabilizing shocks, sometimes from monetary and fiscal policy actions and sometimes from uncontrollable natural forces.

We can and should ask that monetary policy not be destabilizing, but should the monetary authorities be asked to try to correct the mistakes made in the implementation of fiscal policy? When the economy is subject to the disruptive effects of unsound financial policies of a major city or state government, should monetary policy be used to try to offset these effects? Should we try to counter the adverse real economic effects of social policies, such as cleaning up the environment and providing safer products and safer working conditions by monetary policy actions? Should monetary policy be used to try to offset the wealth loss associated with a quadrupling of oil prices or failure of the wheat crop?

I do not believe any of these efforts would be successful, even if they were desirable. I think it is possible to avoid destabilizing actions, and certainly the central bank should be held accountable for any actions that contribute to a worse situation. And I do believe that in the past monetary policies have resulted in worse recessions and worse inflation than would otherwise have occurred. Congressional oversight can insure that monetary policy actions are designed to promote stable monetary conditions and to minimize the uncertainty in financial markets in order that the real economy can adjust most easily and rapidly to its natural full employment, stable price condition.

It is my hope that Congressional scrutiny of monetary policy actions will prevent the erratic accelerations and decelerations in monetary growth that have occurred through most of our history. I think that Concurrent Resolution 133 will contribute towards that objective.

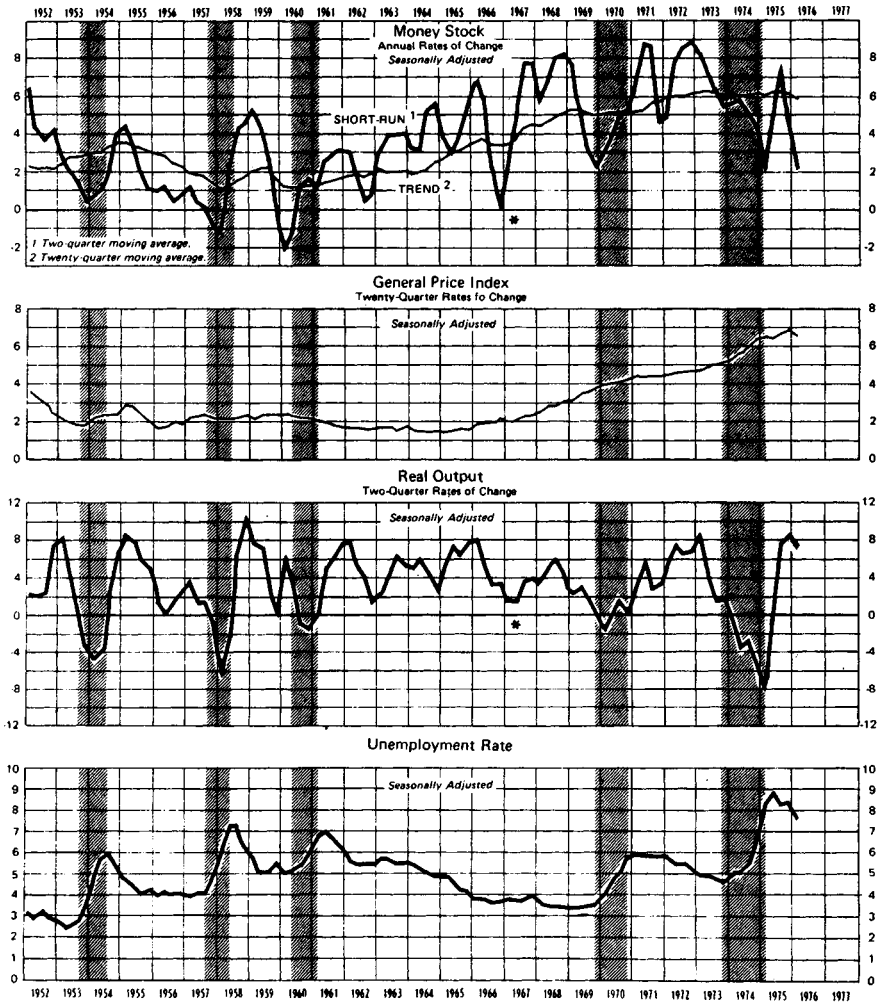
I would like to make a suggestion that I think would help Congress to oversee achievement of money supply growth targets. The growth rates for the money supply announced by the Federal Reserve should be used to set the upper and lower levels for the stock of money that the FOMC thought appropriate in the one-year-ahead quarter. Once the upper and lower levels for the aggregates are set for a quarter, they would remain in effect unless specifically changed. As each quarter passed, the shifting base would be used only to establish the upper and lower bounds for the money

stock in the quarter one-year ahead. But the target levels for the intervening quarters would not be affected. It would be desirable to use narrower target growth ranges than the 2-1/2 to 3 percentage points that the Fed has been using in the past year. Otherwise, if money moved from the lower limit in one quarter to the upper limit in the subsequent quarter, (and the reverse) as each successive quarter passed, a very high variance in the growth rate of money would occur.

The approach I propose in interpreting the Fed's long-run money supply growth targets would prove most useful in dampening fluctuations in money growth if a single target growth rate were announced for each measure of the money supply or if a very narrow growth range, such as one percentage point, were used. In analyzing the procedures for setting money growth targets, it must be kept in mind that two objectives are being pursued. One is to bring about a lowering in the trend growth of the money supply in order to reduce the average rate of inflation in the economy. The second is to minimize fluctuations in money growth around the underlying trend in order to minimize any adverse impact on output and employment.

Chart I

Trends and Fluctuations of Money, Prices, Output, and Unemployment



The shaded areas represent periods of business recessions as defined by the National Bureau of Economic Research.

* A 'mini-recession' occurred in 1/1967.

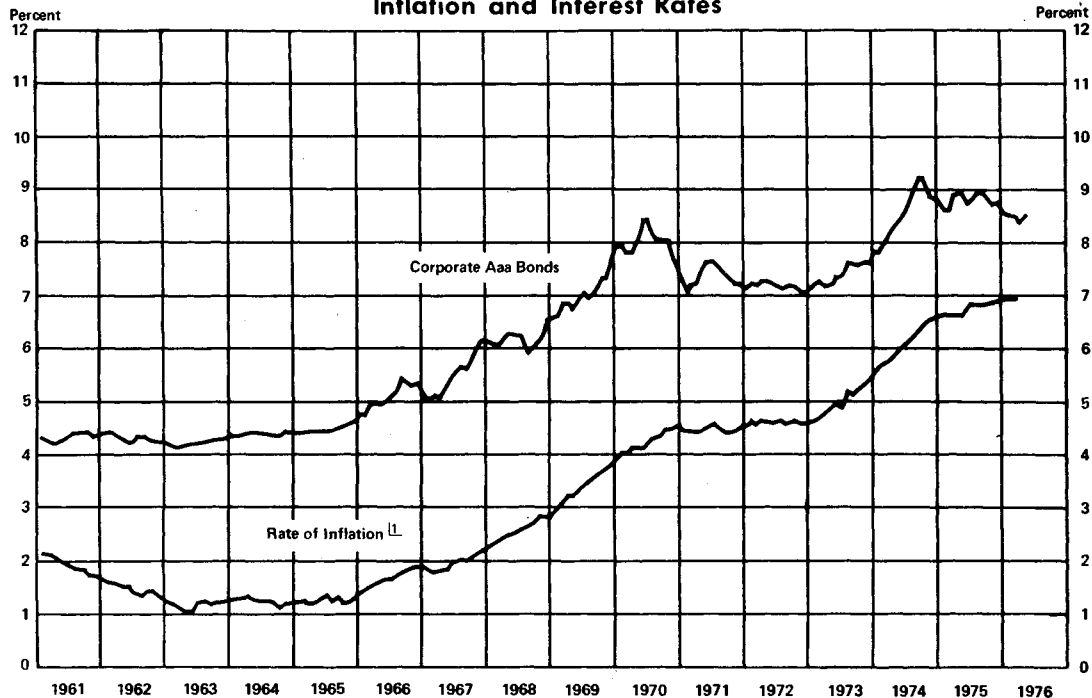
Latest data plotted: 1st quarter.



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Chart II

Inflation and Interest Rates

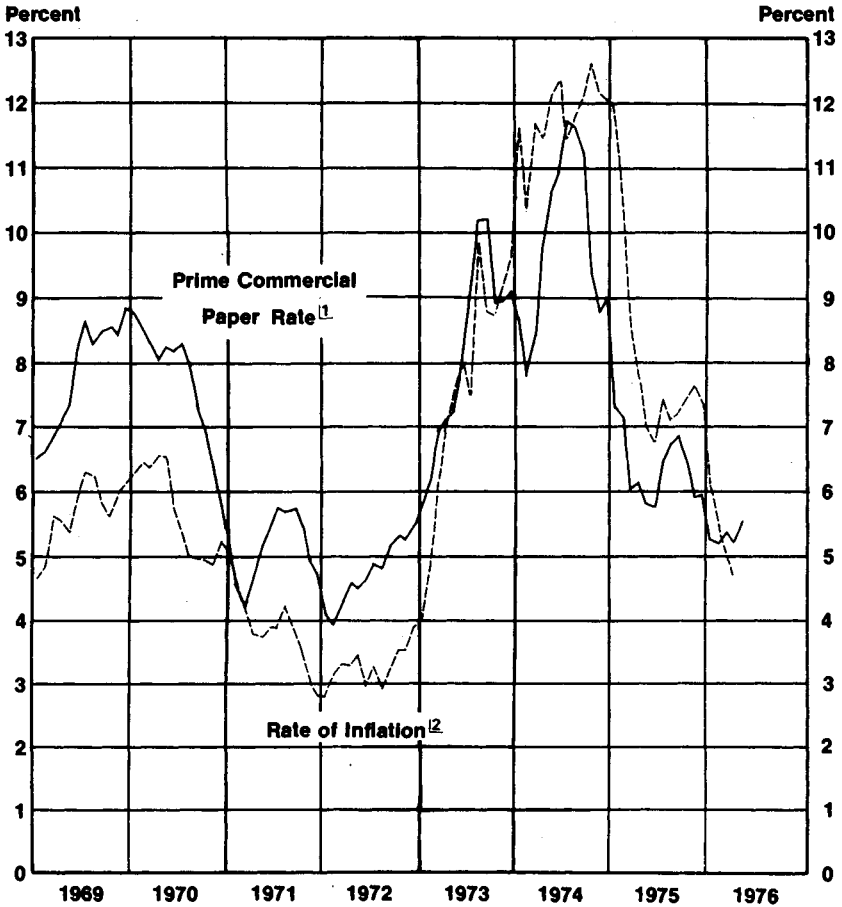


⌊ Rates of change in consumer prices over the previous five years.
 Latest data plotted: Aaa-May preliminary; Inflation-April



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Chart III
Inflation and Short-Term Interest Rates



¹ Yield on 4- to 6-Month Prime Commercial Paper.

² Rates of change in consumer prices over the previous six months.

Latest data plotted: CP Rate- May preliminary
 Inflation- April



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Mr. NEAL. Thank you very much. Now we will hear from Mr. Meiselman.

**STATEMENT OF DAVID I. MEISELMAN, PROFESSOR OF ECONOMICS,
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY**

My name is David Meiselman, and I am a professor of economics at Virginia Polytechnic Institute and State University where I am also director of its new Northern Virginia graduate program in economics located in Reston, Va. I am also a consultant to Bache Halsey Stuart, Inc. The views I express today are my own.

I have devoted most of my professional career to the study of money and its relationship to economic and financial conditions. I appreciate the opportunity to appear before the Subcommittee on Domestic Monetary Policy of the House Committee on Banking, Currency and Housing to present my views on the important questions you are examining in these hearings on monetary policy and the economy.

The Congress, and especially this subcommittee and its counterpart on the Senate side, has unique responsibilities in guiding and monitoring the conduct of monetary policy because of the constitutional provision that "The Congress shall have the power to coin money and regulate the value thereof."

The Congress created the Federal Reserve and delegated to it vast powers to control the Nation's money supply and thereby the value of money. The Federal Reserve was given a large measure of independence, but the independence of the Federal Reserve is to be interpreted only in the sense that under the law the Federal Reserve is independent of the executive branch of the Government, but not the legislative branch. The Fed is a creature of Congress and reports to the Congress. In that sense, the Federal Reserve is different from most agencies of Federal Government which are involved in making and carrying out public policy, especially where economic policy is concerned. To fulfill its constitutional responsibilities, the Congress must exercise close and continuing oversight of the Federal Reserve, and these hearings are a most welcome part of the process.

Although the past record of Congress in monitoring the actions of the Federal Reserve has not been a good one, in the past several years there has been heightened awareness of the importance of monetary policy and of the unique role of Congress in the conduct of monetary policy. One result was the passage, in 1975, of House Concurrent Resolution 133 requiring that the Federal Reserve report to Congress on its intended targets for money change.

The resolution has facilitated systematic congressional oversight of monetary policy which has contributed significantly in turning the economy around in the past year during which we have seen a progressive decline in the pace of inflation at the same time that the unemployment rate has been falling, a happy combination of events many economists, excluding some on this panel, hardly believed possible. I therefore support H. R. 12934 which makes the concurrent resolution a permanent part of the law.

Before commenting on the specific questions which have been put before this panel, I wish to make one general observation about the role of monetary policy. The best attainable goal of monetary policy is to avoid the problems caused by poor monetary policy. The best

attainable monetary policy does not produce goods and services, employ willing workers, promote efficiency or generate economic growth and progress, but poor monetary policy can, and has disrupted and destroyed both freedom and plenty in country after country. Belief that monetary policy can either offset or paper over the consequences of poor public policies which create unemployment by reducing incentives to work or to employ labor, or which discourage economic growth by imposing differentially high taxes on saving and investment, has been a major factor in the inflationary bias of monetary policy over the past decade, the consequences of which have been both more unemployment and less economic growth and progress than would have been the case had we continued the moderate and steady policies of the early 1960's during the Kennedy administration. Appropriate Federal Reserve policy can eliminate the scourge of inflation and attain the desirable goal of stable prices. In turn, stable prices will increase employment, speed growth and lower interest rates, but stable prices or the best possible monetary policy cannot solve all our problems. I know of no informed or responsible student of monetary affairs who asserts that money matters, that monetary policy is important, who has ever claimed otherwise.

By contrast, inflationary monetary policy can only temporarily reduce interest rates or increase employment but at the later costs of higher interest rates, more unemployment and less growth than before the hyp. Repeated experience with excessive monetary expansion has taught enough people about its effects that these lags have become shorter and shorter. In some instances, there is no lag at all, and financial markets adjust almost instantaneously to the latest information and statistics of Federal Reserve actions.

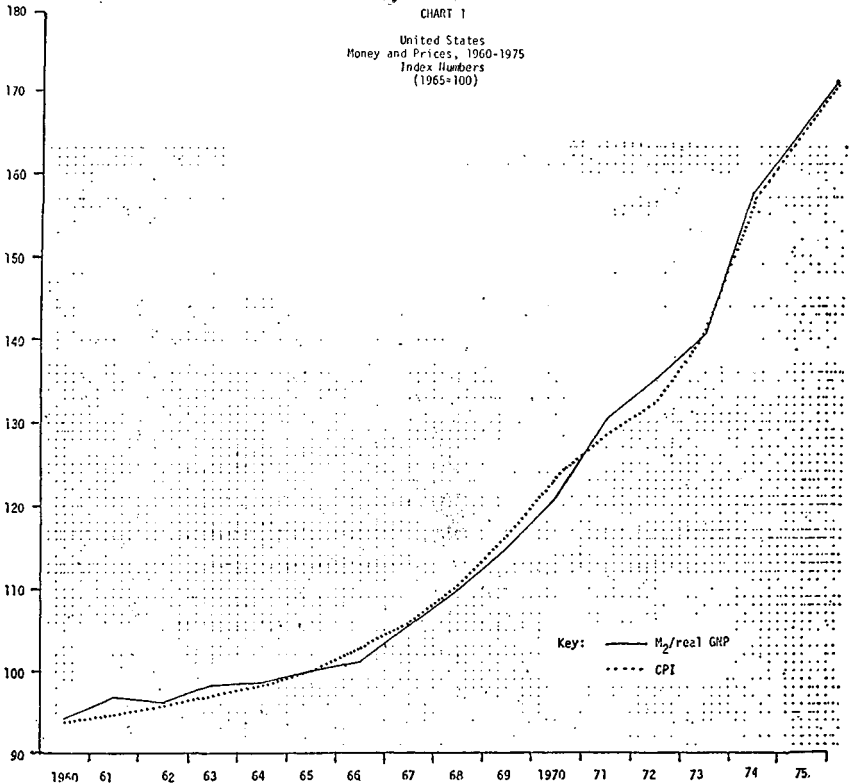
The Fed has announced that it intends to achieve stable prices by gradually slowing the rate of monetary expansion. The Congress would do well to monitor and to support this wise and attainable policy.

I turn now to the specific questions of this set of hearings. Monetary policy is the single most important factor determining the average level of all prices, the cost of living. Monetary policy is mainly concerned with the quantity of money. The Federal Reserve controls the money supply and could do so more effectively if it also did not attempt to control other things at the same time, such as short-term interest rates. The relationship of money to prices, especially long-period or secular changes in prices, is perhaps the single most tested and validated proposition in all of economics, covering a wider range of economic experience in time, place and circumstances than any other, and with essentially the same results.

Prices depend on a ratio of money to output. The rule is that prices rise when money grows faster than output, prices fall when money declines relative to output, and prices tend to stable when money grows at the same pace as output. I know of no important exception to these rules in at least the past 400 years of recorded history.

Because it is generally easier to change the quantity of money than it is to alter output, the quantity of money rather than the volume of output tends to dominate price movements. Recent experience both in the United States and around the world is consistent with these historic norms. There is no basis at all for recent contentions that, at

least for this area, the old laws of economics no longer work. Indeed, over the past 15 years the connections between money and prices have been closer than tended to be the case in the past. Chart 1 shows the close connection, since 1960, between the U.S. Consumer Price Index and the ratio of money to output using the broad M_2 measure of money.

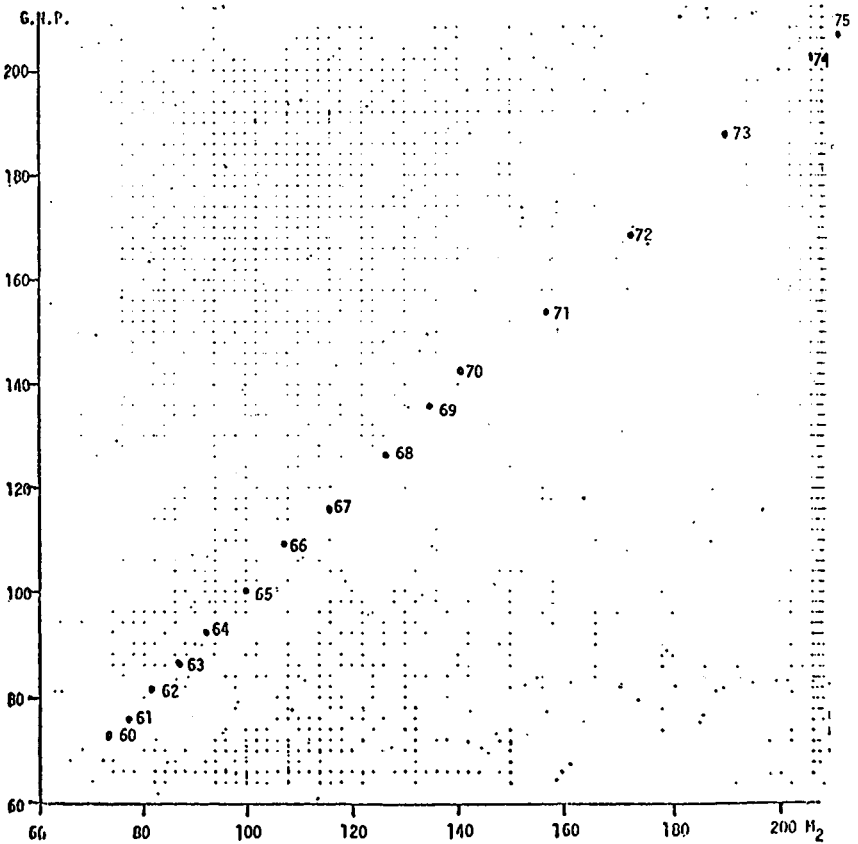


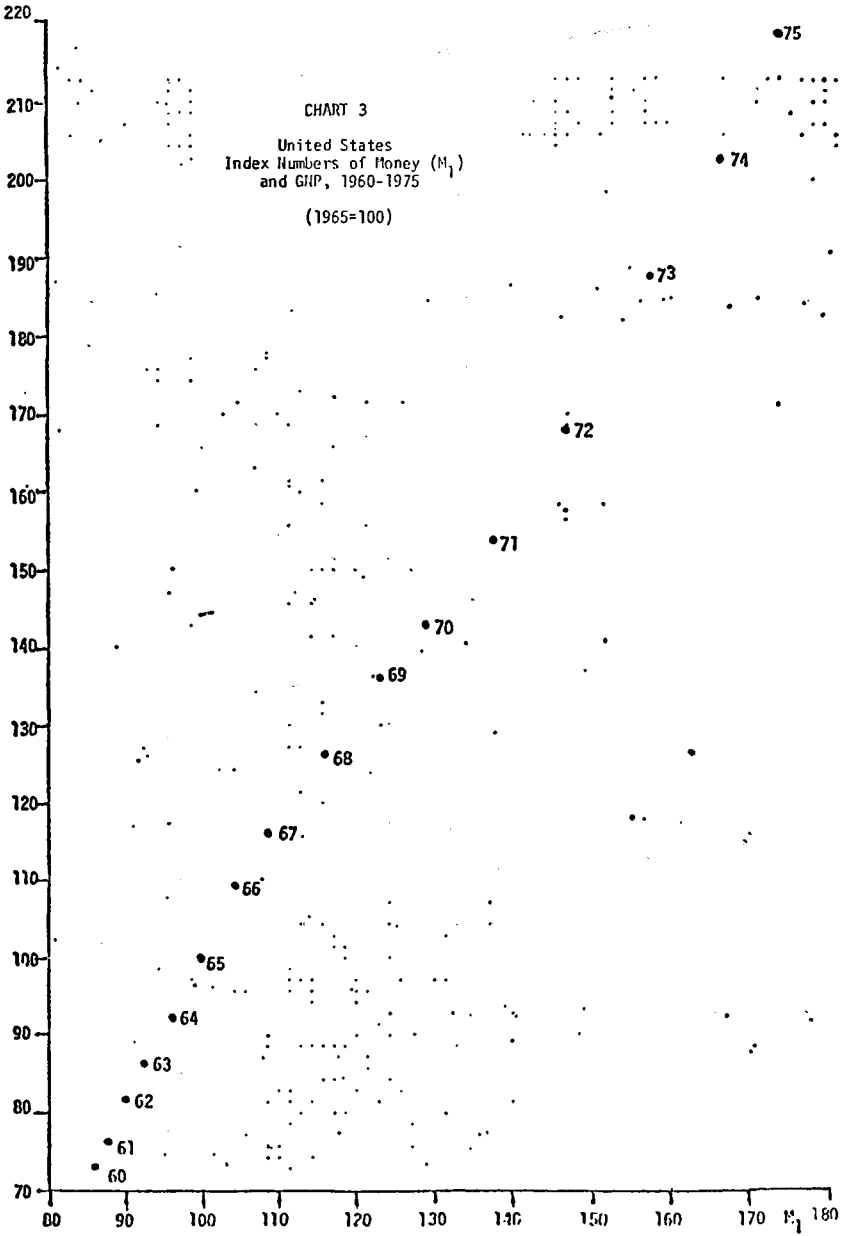
There is another way of looking at the same phenomena. There is a close connection between the quantity of money and nominal GNP. This is true for both the narrow M_1 measure of money, currency and demand deposits, and M_2 , the broader measure of money, currency and all bank deposits less large Certificates of Deposit. Chart 2 shows the close connections between M_2 and GNP since 1960. Income velocity, the ratio of GNP to the M_2 measure of money, has been essentially constant for M_2 since at least 1960. There has also been a close connection between M_1 and GNP over the same period, except that there has been an upward drift in the ratio of GNP to M_1 . It has been rising at the rate of approximately 2.7 percent per year for M_1 , typically rising faster than trend during business cycle expansions and slower than trend during business cycle declines. (See chart 3.)

In the past year the behavior of monetary velocity has conformed to these historic norms, M_2 velocity remaining constant, M_1 velocity rising above its 2.7 percent trend increase.

Nominal GNP depends on the nominal stock of money, but nominal GNP has two component parts, the one is the volume of output, real GNP, and the other is the prices of goods and services measured by the GNP deflator or some other price index. This is the reason that for given nominal GNP, the higher output, the lower prices, and vice versa. Because nominal GNP is essentially fixed by nominal money, it is equivalent to stating that prices depend on the ratio of money to output.

CHART 2
United States
Index Numbers of Money (M_2)
and GNP, 1960-1975
(1965 = 100)





For a given stock of money, which fixes nominal GNP, an increase in spending for one class of goods means that there must be a decrease in the spending for other goods. Thus, for given money, an increase in Government expenditures tends to be at the expense of a decrease in private expenditures. The public sector crowds out the private sector. Alternatively, a decrease in Government expenditures, given the quantity of money, generally makes it possible for the private sector to expand. If more Government expenditures are financed by an increase in the public debt, the resulting higher interest rates bear most heavily on expenditures most sensitive to interest rates such as housing. Government crowds out housing. If Government expenditures are financed by higher taxes, the specific results are more difficult to generalize because different taxes have different effects. In any event, when allowance is made for the quantity of money, the short-run stabilization impact of changes in fiscal policy, that is variations in the size of the budget or in the schedules of tax rates have been either minor or absent. Moreover, I know of no country which has brought inflation under control by means of fiscal policy alone, that is, without correspondingly limiting the stock of money. Indeed, many countries have tried, but as far as I know, none has succeeded.

Taxes and expenditures should be determined by considerations of long-run efficiency and equity. I see no useful purpose in varying tax rates or expenditures to achieve hoped-for stabilization results, especially in the face of overwhelming evidence of the ineffectiveness of fiscal policy, especially of the fine-tuning variety. To vary the old saw, if money policy is properly used, fiscal policy is unnecessary. If money policy is not properly used, fiscal policy won't do any good.

I briefly turn to the question of interest rates and the relationship of interest rates to monetary policy. Although there is growing understanding of the connections between money and interest rates, there is still widespread confusion between money and credit and between cause and effect. Market interest rates have two components, the real rate of interest and the inflation premium, the expected rate of change of prices. It turns out that an expansionary monetary policy tends to drive up market interest rates, not lower them, and a contractionary policy tends to lower market rates, not raise them. The main reason is that more money leads to more spending. In turn, more spending means higher output or higher prices, or some combination of the two. If the increase in aggregate spending increases only output and employment, business becomes more profitable. The productivity of capital rises, inducing more borrowing, which pushes up real interest rates. On the other hand, if the increase in aggregate spending merely drives up prices, interest rates rise to incorporate the inflation, especially as people come to anticipate more future inflation. Concerning both effects, expansionary monetary policy leads to higher interest rates as in recent years, contractionary monetary policy causes lower interest rates, as in the great depression of the 1930's. In other words, easy money leads to tight credit. Tight money leads to easy credit. I have done extensive statistical and theoretical studies of these relationships and will submit some of them for the record.

I understand that at yesterday's hearing there was some support expressed by Congressman Adams for a policy that would require

that the Federal Reserve peg the Treasury bill rate at 5½ percent, partly to hold interest costs of the public debt within budget totals.

This policy is certain to lead to disaster, either of cumulative and explosive inflation, or cumulative and implosive deflation. If free market interest rates are above 5½ percent, the Federal Reserve can initially force them down to 5½ percent by creating additional Federal Reserve credit and thereby additional bank reserves to bid up bill prices (bid down bill yields). But once the new money was out in the economy, following the mechanism I have just summarized, the increased quantity of money would cause both more inflation and still higher interest rates than before the attempt to lower rates. The longer the Federal Reserve tried to maintain the artificially low rate, the more inflation and the higher interest rates would go.

If free market rates were less than 5½ percent, trying to force rates up or keep them up would require cumulative decreases in money, and a corresponding downward spiral of prices and interest rates. In the process, output and employment would also suffer.

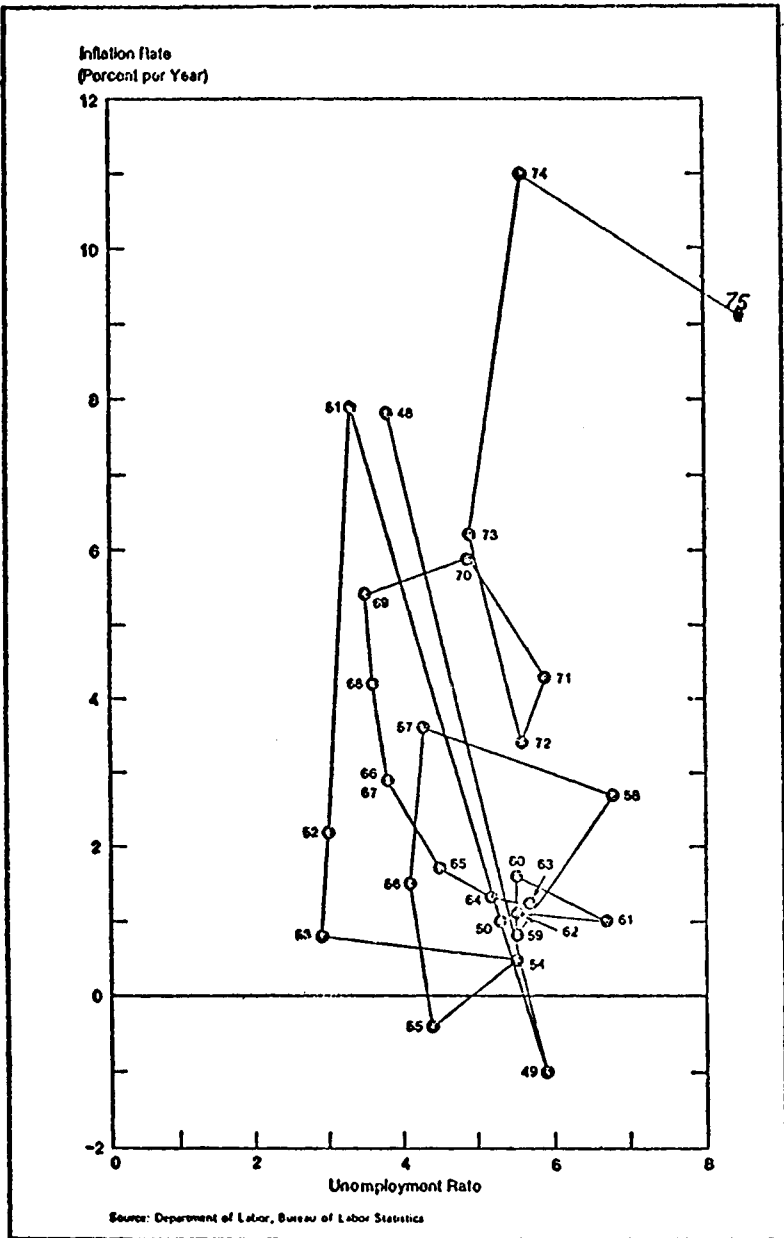
I turn finally to the relationships between money and employment. It is important to distinguish the initial from the later impacts of monetary change. When there is an increase in the stock money which correspondingly causes an increase in aggregate spending, in many markets the first impact is seen in an initial set of events that includes increased sales and rising output and employment before later changes in prices. In other words, there are quantity adjustments before price adjustments. Thus, as in 1972, expansionary monetary policy leads first to the good results of increased output and employment before the later bad results of higher prices, whereas monetary restraint may, as in 1974 and 1975, lead to the bad results of reduced output and employment before the later good results of moderating inflation, as in 1976. This asymmetry has been one of the major sources of widespread myopia about the inflation process and of the inflationary bias of public policy.

I may add that I see no evidence for the contention, usually labeled the Phillips Curve, that inflation is not only helpful, but necessary, to achieve and maintain high levels of employment and growth. (See chart 4.) Indeed, I have recently argued elsewhere¹ that, on the contrary, more inflation leads to more unemployment. The initial burst of inflation may temporarily reduce unemployment in the first instance if it comes as a surprise because product or output prices rise relative to labor costs, thereby inducing an increase in the demand for labor. If inflation continues, the entire economy, including all wages and prices, adjusts to the ongoing inflation. Because there are no permanent surprises, there are no permanent employment gains. I suppose I could quote Abraham Lincoln at this point.

To affect output and employment, inflation must be unanticipated. For public policy to use inflation to make employment and output different from what it would otherwise be means that public policy must be directed at fooling people—which is hardly a proper or effective basis for public policy in the first place. But as time goes on, it becomes progressively more difficult to fool people. This is why this kind of policy leads to greater and greater instability, heaped on top of more and more inflation. In the stop-go policies, the “stops” and “go’s” inevitably become more pronounced.

¹ David Melselman, “More Inflation: More Unemployment,” *Tax Review* (Tax Foundation, January 1976).

Chart 4: The Inflation Rate and the Unemployment Rate, 1948-1975



Trying to fool participants in one area of the economy by the use of policies affecting the entire economy leads to a vast widening of the range of uncertainty about future events, which undermines the

efficiency of intertemporal decisionmaking involving saving, investment, asset management, and the like. It also effectively destroys economic information essential to the efficient operation of the economy.

The price system which characterizes the market economy is a very efficient means for conveying large amounts of information. One of the characteristics of variable and unanticipated inflation is that people effectively have less information about current prices and markets. Individuals and business firms tend to learn about prices and markets in a sequential manner. As they keep receiving new information, old information is revised or discarded.

Large-scale unanticipated inflation impairs the orderly learning and adjustment process. The loss of information can be overcome by devoting more resources to data gathering, updating price lists and the like. Doing so uses time and resources, and is costly. Information and search costs rise, which alone cause an increase in unemployment, a decrease in efficiency, and a deadweight loss to the economy. One manifestation of how inflation destroys information is that ordinary accounting statements mean less and less as the inflation process proceeds.

The increased uncertainty and lack of information about future events weakens the basis for rational and efficient decisionmaking and economic activity. It becomes more difficult, and in many respects impossible, to plan for the future including making provisions to accumulate real resources for retirement, for sending children to college, for contingencies and for all the other reasons people wish to save so they can attain and depend on future real income and real wealth. For the same reasons, even highly skilled financial managers cannot plan efficiently, business managers have less firm bases for making judgments about future products, labor and materials markets and capital outlays—partly because the effects of inflation are not uniform.

Unfortunately, there is no effective way to hedge against inflation, to insure against its consequences, or to make contracts in units of stable purchasing power.

Thus, the continued process of variable, unanticipated inflation does not increase employment. Rather, it has a cumulative and negative impact on efficiency and on resource allocation. Returns to both labor and capital suffer. This, taken together with the distortions of the inflation process, impairs the flexibility of markets and thereby causes an increase in unemployment. And, when rising unemployment has called forth public policies that lead to still more inflation, the unemployment rate ends up still higher, even though there may be some initial and temporary improvement.

These are some of the reasons it is essential to abandon the deliberate use of inflation as an instrument of public policy, even for short periods of time. To avoid abrupt shocks to the economy, the inflation should be slowed gradually and eliminated over a 3- to 5-year period. The maintenance of general price stability will require steady, non-inflationary courses for monetary and for fiscal policies. For monetary policy this means a long-term growth of money in the range of 2 percent to 4 percent per year for M_1 or 4.5 percent to 6.5 percent for M_2 ; for fiscal policy, relatively stable taxes and expenditures close to or at a balanced budget.

In the past year, Federal Reserve policy has been consistent with these goals and targets. The Congress would make a great contribution to the Nation's welfare if it continued its close and informed oversight of Fed activities to help achieve the attainable goal of price level stability.

Thank you.

Mr. NEAL. Thank you for your testimony. Just one question. How did you arrive at that goal?

Mr. MEISELMAN. Two to 4 percent?

Mr. NEAL. Right.

Mr. MEISELMAN. I explained that in detail before this subcommittee a year and a half ago. First, long-term economic growth of the United States has been in the range of 3.5 to 4.5 percent per year. Second, the Consumer Price Index is generally acknowledged to have an upward bias in the range of 1.5 to 2 percent. Because of quality improvements and related technological factors not adjusted for in the statistical construction of the index, consumers have just about as much purchasing power for each one of their dollars when the official index is increasing in the 1.5- to 2-percent range.

This was generally the situation that prevailed in the first half of the 1960's. Third, on the other side, the income velocity of M_1 , the ratio of gross national product to M_1 , has been drifting up at about 2.5 percent per year. For M_2 , the ratio of gross national product to M_2 has been essentially constant since at least 1960. Taken together, we get a range of 2 to 4 percent for M_1 , and 4.5 to 6.5 percent for M_2 .

(A study submitted by Professor Meiselman appears on page 67.)

Mr. NEAL. Now we will hear testimony from Mr. Perry.

STATEMENT OF GEORGE PERRY, SENIOR FELLOW, BROOKINGS INSTITUTION

Mr. PERRY. It is a pleasure and a privilege to testify before this subcommittee today on the important issue of monetary policy and the economy. You raised several specific questions that you were interested in, and my answers to these questions will be very brief. I shall, of course, be happy to expand on them or on any other questions you may have.

Questions 1 and 2: How Monetary Policy Affects the Cost of Living, Production and Employment.

I have grouped the first two questions into one because they are best answered together. Monetary policy is a potent instrument for affecting the level of aggregate demand in the economy. Its impact on the economy is transmitted through interest rates and falls most heavily on private demands that depend heavily on borrowing, such as the demand for autos, business investment, and housing.

It also influences other spending by affecting equity prices and hence consumer wealth and possibly consumer sentiment.

The effect of monetary policy on prices, production and employment follows from its effect on total demand. But how any change in total demand is divided between a change in prices, on the one hand, and a change in production and employment, on the other, basically has nothing to do with monetary policy.

It is determined by a great many other things, such as how tight labor and product markets are and what expectations about inflation are. Our understanding of this inflation process is far from perfect.

But the evidence is clear that, how a given GNP growth is achieved—whether the spur is a push from fiscal policy, a rise in demand from abroad for our exports, a consumer love affair with the automobile models, or a lift from monetary policy—the consequences for inflation and production are generally the same.

There is simply no evidence of what I call the X-ray theory of monetary policy whereby it affects the price level directly without affecting the real economy along the way.

Next your question 3: How Interest Rates are Affected by Money Supply Changes.

Basically interest rates bring the demand for money in line with the supply. If either real output or prices rise, the demand for money will rise. If the supply of money is not increased enough to meet this higher demand, interest rates will be driven up. Then this will restore the balance between demand and supply in two ways: First by causing individuals and businesses to hold less of their liquid assets as money and more of their assets in some interest bearing form; and second, by curtailing the demand for goods in the economy and thus curtailing the rise in GNP.

To the extent that a rise in prices enters expectations about future inflation rates, it enters the picture in a second way; by raising the level of interest rates that is associated with any given level of real output in the economy.

Your question 4: How Government spending and tax policies enter the picture.

Government spending and tax policies taken together constitute fiscal policy, which is the other arm of Government stabilization policy. Changes in fiscal policy influence aggregate demand just as changes in monetary policy do. The two can substitute for each other or can complement each other at any particular time.

And just as with monetary policy, how a given increase in aggregate demand divides up between higher prices and higher production does not depend on whether that rise in demand prices arises from fiscal policy or from some other source.

Your question 5: Should Congress set economic targets?

Particularly at a time when we face both high unemployment and inflation, and the goal of policy is to reduce both, the conduct of stabilization policy is difficult because measures affecting demand can only promote the achievement of one goal at the expense of the other. It seems entirely proper for the Congress to again set priorities between these goals and to ask that the Fed respect those priorities.

However, the Fed cannot solve the dilemma that is posed by conflicting goals. Nor can it necessarily pursue economic targets while constrained to follow some particular path for the money supply.

Nobody knows, with any useful degree of accuracy, what growth in the money supply would be needed to achieve a particular growth rate of GNP over the coming year. However, it seems reasonable to ask the Fed to aim for some agreed upon targets for the economy, as opposed to targets for money supply, and to explain any policy moves that do not contribute to hitting that target.

Thank you. Would you like us to comment on your chart at this time?

Mr. NEAL. I would. I want to thank you all for your excellent, thoughtful testimony. It will be a great help to us. Mr. Meiselman, you mentioned some statistical work you have done and offered to submit that for the record. I think that would be most helpful. The work you mentioned concerns the long-term relationships between money supply and inflation.

Mr. MEISELMAN. The connections between inflation and interest rates and also the connections between changes in the stocks of money and changes in inflation, on the one hand, and changes in interest rates, on the other.

Mr. NEAL. The subcommittee would appreciate copies of that work, and without objection I request that it be inserted in the record at this point.

[The material submitted for the record by Mr. Meiselman follows:]

MONEY, FACTOR PROPORTIONS, AND
REAL INTEREST RATES*David I. Meiselman
Virginia Polytechnic Institute and State University
Reston, Virginia

Introduction

I shall argue that an increase in the quantity of money when an economy is not fully employed leads to an increase in the real rate of interest in theory as well as in fact. I shall also argue that attempts to raise rates of interest by means of monetary restriction will cause interest rates to fall. The theory is generated by an old friend, the Law of Variable Proportions. The facts have been generated by much sad experience.

The apparatus invented by J.R. Hicks in his famous article, "Mr. Keynes and the Classics," has become standard equipment for economists for the analysis of a wide range of macro phenomena. As pure apparatus, the Hicksian constructs of the LM and the IS curves are generally taken to be devoid of empirical content. Of course, some cases are ruled out on the basis of stability considerations. Unstable situations, while possible, are not sufficiently characteristic of free markets, and because markets ordinarily do not behave as if they are unstable, we separate the formal conditions which are consistent with this observed behavior in free markets from those which are not.

* Presented at the Zurich Meetings of the Econometric Society, September 10, 1964. Preliminary versions were presented at the Johns Hopkins University, the University of Chicago, Northwestern U., the University of Minnesota, and Columbia.

It is in this spirit that many students of macro phenomena have tended to postulate that the slope of the Hicksian IS curve typically has a negative slope, but may in principle range between zero and ∞ .

Thus, given conditions of less than full employment, the standard analysis would assert that a shift to the right of the LM curve, an increase in the stock of money, moves along the negatively sloped IS curve so that at the new equilibrium we will have higher income and lower interest rates, provided, of course, that there is no "liquidity trap" and that either investment and/or saving have non-zero interest elasticities. This is to say that the LM curve is not infinitely elastic and the IS curve is not perfectly inelastic with respect to the rate of interest.

Also, a shift to the right of the IS curve, a "real" disturbance, will lead to both higher income and interest rates as we move along the positively sloped LM curve, and vice versa for a downward shift of the IS curve. This, in brief, is "traditional" post-Keynesian theory.

The facts of cyclical change appear to be that the changes in the stock of money lead business cycle turning points. On the other hand, interest rates, and also private investment spending, are generally synchronous with the cycle, but with some tendency to lag behind business cycle turns. The facts do not appear to square with traditional theory.

Moreover, if, indeed, money is the principal determinant of business cycles, why do we observe that interest rates appear to end up at higher rather than lower levels after a monetary expansion, and vice versa for a monetary contraction?

One approach to this problem has been to emphasize the role of price expectations in the determination of market yields on fixed nominal value obligations,¹ but these considerations have little bearing on real rates of return or on short period changes over the cycle. In addition, interest rates in money terms, and often in ex post real terms too, end up at higher rather than lower levels after monetary expansions which start at periods of less than full employment, with the opposite change for a monetary contraction.

These facts in the context of the standard analysis have been used to try to distinguish between monetary and real sources of cyclical change-- which is to say, whether the LM or the IS curve has shifted. The procedure follows the familiar lines of examining price and quantity data to identify whether the observed change in price stems from a shift of supply or of demand.² The identification process appears to suggest several paradoxes, both for those who maintain that shifts of the LM curve generally arising from changes in the stock of money are the source of cyclical change and for those who assert that changes in "real" factors summed up in the IS curve, especially investment spending, dominated the cycle.

"Monetarists" can, and do, point to the cyclical lead of money and the

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1. See D. Meiselman, "Bond Yields and the Price Level: The Gibson Paradox Regained," in Banking and Monetary Studies in Commemoration of the Centennial of the National Banking System, ed. D. Carson (1963).
 2. For example, see J.L. Stein, "A Method of Identifying Disturbances which Produce Changes in Money National Income," JPE, February 1960.

general conformity of the magnitude of monetary change and income change as supporting their case. They also cite the lag of investment and perhaps the lack of a statistically dependable link between investment and income as weakening the case of the "realists." "Monetarists" may also argue that the lag of investment behind money is also indicative of the direction of effect.

Yet, if monetary change is the principal contributor to cyclical change, why are interest rates high in boom times and low in depressions? The "realists" have no problem here because they easily explain the cyclical association of income and interest rates as stemming from the same source, the shift in investment. However, "realists" may also be in trouble because of the cyclical lead of money and the occasional lag of investment. Although many "realists" assert that changes in interest rates cause corresponding changes in the money supply, they cannot explain the cyclical lead of money over both interest rates and income.

The purpose of this paper is to show that the usual assumptions regarding the IS curve in the standard analysis are unnecessarily restrictive and may lead to analytically erroneous results, such as the requirement that the IS curve have a negative slope for stable general equilibrium.³

3. There are other problems with the apparatus which are beyond the current scope of this paper, among them the lack of distinction between real and nominal interest rates, the specification of equilibrium especially with respect to "time," and the implied requirement that an initial change in the money supply shifts the LM curve which moves along the given IS curve. This is a formal way of stating that only the "bond" market is used to adjust actual to desired cash. If money shares a margin with goods, a shift of the LM curve may cause a short-run shift of the IS curve in the same direction. In other words, disequilibrium on money(cont'd)

First, I shall examine the formal conditions for a positively sloped IS curve, and I shall show that these are consistent with the range of plausible assumptions regarding the values of the parameters determining the slope of the IS curve. The paper will go on to suggest how the facts of cyclical change cited above can be rationalized in the context of elements of a theory of business fluctuations which follow from this critique. The theory also suggests processes--in some respects strikingly similar to Wesley Mitchell's--by means of which monetary change may lead to important changes in real variables which are often held constant in the standard analysis.

The Slope of the IS and LM Curves

Consider the Hicks model presented in "Mr. Keynes and the Classics" for the joint determination of income and the rate of interest.

$$I = I(r, Y)$$

$$S = S(Y, r)$$

$$L = L(Y, r)$$

where I , S , and L are desired or ex ante investment spending, saving (current income not spent for consumer goods), and the quantity of money demanded, respectively. Y is current real income or output and r is the rate of interest.

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3. account ought to be arguments in the short-run consumption and investment spending functions. In addition, the LM and IS curves may not be independent. For a given IS curve, a shift in the LM curve, by causing income to change in this period may lead to a shift of the IS curve in the same direction, which may be another way of discussing a positively sloped IS curve. However, for purposes of this paper let us wear Hicks' hat.

General equilibrium requires that

$$I = S$$

and

$$L = M$$

where M is the stock of money. To avoid complications not directly pertinent to this discussion, assume static expectations with respect to prices. The more general analysis requires real rates of return in the goods equations and money rates of interest incorporating price level expectations in the money equations.

The LM curve is defined as the locus of points of alternative combinations of Y and r where $L = M$, and the IS curve is similarly defined for $I = S$. (The schedules are usually drawn for Y on the horizontal axis and r on the vertical axis.) The simultaneous clearing of both "goods" and "money" markets is at the point of intersection of the two curves, and this point shows the equilibrium values of r and Y for the system.

Consider first the slope of the LM curve, $\frac{dr}{dY}$. Each point on the schedule is defined so that $L = M$. If $L = M$, $dL = dM$.

Also,

$$dL = \frac{\partial L}{\partial r} dr + \frac{\partial L}{\partial Y} dY$$

and

$dM = \frac{\partial M}{\partial r} dr + \frac{\partial M}{\partial Y} dY$, the least restrictive formal assumptions about M in the present context. Therefore,

$$\frac{\partial L}{\partial r} dr + \frac{\partial L}{\partial Y} dY = \frac{\partial M}{\partial r} dr + \frac{\partial M}{\partial Y} dY.$$

Solving for $\frac{dr}{dY}$ when all variables are functions of r and Y we have

$$\frac{dr}{dY} = \frac{\frac{\partial M}{\partial Y} - \frac{\partial L}{\partial Y}}{\frac{\partial L}{\partial r} - \frac{\partial M}{\partial r}}$$

By hypothesis $\frac{\partial L}{\partial r} < 0$,

and

$$\frac{\partial M}{\partial r} \geq 0$$

so that the denominator is < 0 . Because it is usually assumed that $\frac{\partial L}{\partial r} <$

the denominator becomes < 0 .

In the numerator, by hypothesis,

$$\frac{\partial M}{\partial Y} = 0$$

and $\frac{\partial L}{\partial Y} > 0$

making the numerator also < 0 .

With both numerator and denominator < 0 , $\frac{dr}{dY}$ for the LM curve becomes > 0 , with $\frac{dr}{dY}$ varying directly with the income and inversely with the interest elasticity of the demand for money.

Similarly, the slope of the IS curve can also be determined. Each point on the IS schedule is defined so that $I = S$, or $dS = dI$.

$$\text{Now } dS = \frac{\partial S}{\partial r} dr + \frac{\partial S}{\partial Y} dY,$$

$$\text{and } dI = \frac{\partial I}{\partial r} dr + \frac{\partial I}{\partial Y} dY.$$

Solving for $\frac{dr}{dY}$ as above, we have

$$\frac{dr}{dY} = \frac{\frac{\partial I}{\partial Y} - \frac{\partial S}{\partial Y}}{\frac{\partial S}{\partial r} - \frac{\partial I}{\partial r}}$$

Regarding the terms in the denominator, by hypothesis $\frac{\partial S}{\partial r} \geq 0$ and $\frac{\partial I}{\partial r} \leq 0$. The sum in denominator must be ≥ 0 as a formal matter, but let us rule out the zero value, the popularity of the extreme Keynesian variant of Stigler's Law notwithstanding, making the denominator > 0

under the usual assumptions. A clear case for the sign of the expression in the numerator cannot be made, even though many economists have erroneously done so. By hypothesis, $\frac{\partial I}{\partial Y}$ and $\frac{\partial S}{\partial Y}$ are both greater than or equal to 0. Therefore,

$$\begin{aligned} \frac{dr}{dY} > 0 & \text{ if } \frac{\partial I}{\partial Y} > \frac{\partial S}{\partial Y} , \\ \frac{dr}{dY} = 0 & \text{ if } \frac{\partial I}{\partial Y} = \frac{\partial S}{\partial Y} , \\ \text{and } \frac{dr}{dY} < 0 & \text{ if } \frac{\partial I}{\partial Y} < \frac{\partial S}{\partial Y} . \end{aligned}$$

Many have ruled out the case where $\frac{\partial I}{\partial Y} > \frac{\partial S}{\partial Y}$ because they presumed that this situation was not consistent with stability; it is taken to mean that the marginal propensity to spend out of income, the sum of the marginal propensity to consume plus the marginal propensity to invest (desired "induced" investment) was greater than unity and thereby explosive. Yet, stable general equilibrium is consistent with $\frac{\partial I}{\partial Y} > \frac{\partial S}{\partial Y}$ provided the slope of

3a. According to Stigler's Law, "All Demand Curves are Inelastic, and All Supply Curves are Inelastic Too." See "Stigler's Law" in George J. Stigler, The Intellectual and the Market Place and Other Essays.

the LM curve is greater than the slope of the IS curve, which is to say, that the LM curve cuts the IS curve from below. Under these circumstances, shifts of either schedule are possible without unstable effects. Except for the unlikely case where the IS and LM curves coincide, a case of metastable equilibrium, if the schedules are linear there is but one combination of income and the rate of interest consistent with equilibrium. If points off the equilibrium are examined it will be found that the set of forces summed up in the curves will drive the system towards the point of intersection. In other words, when one considers total rather than partial derivatives the marginal propensity to spend need not be greater than unity.

Although the adjustment patterns are by no means clear, a positively sloped IS curve does mean that an increase in the stock of money or a decrease in the demand for money ultimately leads to a rise in both interest rates and income, and a decrease in the stock of money or an increase in the demand for money leads to both lower interest rates and lower income. Shifts of the IS curve follow the standard analysis because we would be moving along the same positively sloped LM curve. Therefore, shifts of either positively sloped schedule lead to movements in the same direction of both income and the rate of interest.

The reason for these apparently bizarre results is that desired investment is more responsive to income than is desired saving when interest rates are held constant. In other words, a shift to the right of the LM curve, by causing income to rise initially, somehow causes a shift in

desired investment which is greater than the induced rise in saving for given interest rates. As we shall see below, it is not unlikely that this is the case under a broad range of plausible real world assumptions.

Factor Inputs, the Law of Variable Proportions, and Investment

Let us now move on to consider the source of a shift in the marginal efficiency of investment. It is generally agreed that sticky money wage rates are a principal cause of the cyclical variability of employment, and thereby output. Further, it is also generally accepted that shifts in aggregate demand induce corresponding short-run shifts in employment and output by changing the relationship between money wage rates and other prices, which is to say, the real wage rate. To isolate some of the consequences of the usual analysis of the labor market, assume the following:

1. Money wage rates are fixed.
2. Unemployment exists, and the supply of labor is infinitely elastic at the money wage rate.
3. The stock of capital is fixed and is equal to the desired stock of capital for all firms.
4. The production function is Cobb-Douglas with constant returns to scale, and is given.
5. All goods are produced by both capital and labor, and relative prices of goods are given.
6. The flow supply schedule of capital goods is infinitely elastic at its real price.

7. The demand for money is a function of both income and interest rates.
8. All values are "permanent" in the sense that everybody expects today's prices and quantities to persist beyond the relevant horizons.

These assumptions will be relaxed at later stages in the analysis.

Consider an increase in aggregate demand stemming initially from an increase in the stock of money - a shift to the right of the positively sloped LM schedule. The higher level of aggregate demand will tend to raise product prices relative to labor costs, thereby inducing a movement along the demand schedule for labor, where the quantity of labor demanded is a function of the real wage rate and the marginal product of labor.⁴ If the production function is Cobb-Douglas and markets are competitive, the elasticity of demand for labor is given by $\frac{1}{1-a}$, where a is the labor share and $(1-a)$ is the capital share. If a is $2/3$, the elasticity of demand for labor with respect to the real wage rate is 3. Therefore, a 1 percent decline in the real wage stemming from a 1 percent rise in prices will increase employment by 3 percent, which in turn will increase output by 2 percent.⁵ Money income will therefore rise by slightly more than 3 percent. In other words, the elasticity of the aggregate supply curve with respect to the price level is $\frac{a}{1-a}$; here two.

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4. Note also that average variable costs in real terms fall, an important element in the business cycle theories of Mitchell and many others.
 5. In the process some capital will be added to the pre-existing stock, but the relative change in the capital stock will be small so that for the time being we may safely overlook it.

As more labor is added to the fixed capital stock, the marginal product of labor declines by a factor of $(1-a)$ times the percentage increase in the labor input. In the above example, the 3 percent rise in employment would be associated with a 1 percent fall in the marginal productivity of labor, which is also the decline in the real wage rate. Total payments to labor in real terms will rise by 2 percent, and in money terms by slightly more than 3 percent.

The increase in the ratio of labor to capital will increase the productivity of capital, the other side of the Law of Variable Proportions coin. It is this change, some manifestations of which run through the literature on the Acceleration Principle, which is the source of the corresponding shift in the demand for capital goods and investment spending. The marginal product of capital will rise by a factor of a times the percentage increase in the labor input. To continue the example, when employment rises by 3 percent and the capital stock is fixed, the marginal product of capital, as well as total payments to capital in real terms, increase by 2 percent, which is also the percentage increase in output. The rise in the productivity of capital, a source of higher interest rates, follows from a decline in the real wage rate when capital and labor are substitutes in production, as they are in the Cobb-Douglas production function.

In other words, the endogenous change in the productivity of capital is the endogenous basis for a change in the desired stock of capital in order to arrive at an optimum stock under the new conditions.

In turn, the rise in the desired stock of capital will tend to increase the marginal efficiency of investment and thereby induce a rise in investment expenditures, and a further sequence of higher income, a rise in employment and in the ratio of labor to capital, a further shift in the marginal efficiency schedule, and so forth.

As investment and income rise there will be upward pressure on interest rates, causing a rise in income velocity as we move along the given LM curve. The rise in rates will be tempered by the additions to the stock of capital, velocity changes, and a rise in induced saving.⁶ To answer the question whether rates will end up at a higher level than before the once for all monetary change, one must also include the initial partial effects of the increase of money, which would be consistent with lower rates. Taken together, it is not at all clear where the rate of interest will finally come to rest when we return to simultaneous equilibrium in the "money" and "goods" markets.

Starting from equilibrium, a mirror image of this sequence would take place when the stock of money was reduced in the presence of sticky money wage rates - the initial rise in rates perhaps, the fall in aggregate demand, reduced employment and a rise in average variable cost, a rise in the ratio of capital to labor and a corresponding decline in the productivity of capital, and so forth, until perhaps we end up with interest rates at lower levels than before the monetary contraction that caused the downturn.

6. If the cumulative expansion proceeds far enough, there will also be pressure on wage rates and the relative prices of capital goods, further moderating the expansion.

To help focus on the specific formal problem, let us hold the interest rate constant and examine the partial effects, "income" effects, of the increase in the money supply. If $\frac{\partial I}{\partial Y} > \frac{\partial S}{\partial Y}$ it means that the pre-existing rate of interest, r_0 , is below its new equilibrium value. On the other hand, if $\frac{\partial I}{\partial Y} < \frac{\partial S}{\partial Y}$ it means that r_0 is too high, which is to say, that rates would end up lower after the monetary expansion.

To move from considerations of the marginal productivity of capital to the value of $\frac{\partial I}{\partial Y}$ consider the variables K^* , A , and B , where K^* is the desired stock of capital, A is the partial derivative of K^* with respect to income, $\frac{\partial K^*}{\partial Y}$, and B is an adjustment coefficient denoting the rate per period at which the economy desires to close the gap between K^* and K , the actual stock of capital. B is measured in the same units of time as Y .

Neither A , B , nor $\frac{K^*}{Y}$ can properly be considered constants. A and B will vary inversely with the rate of interest and will also depend on such variables as technological factors, supply conditions, expectations, and cost conditions associated with "capacity" discussions, and so forth. B may also depend on the size of the "gap," $(K^* - K)$. Similarly, the desired capital output ratio, $\frac{K^*}{Y}$, where Y is "permanent" or "expected" income is not a constant but will depend upon the production function and will also vary inversely with the rate of interest and the uncertainty and other equalizing difference adjustments required to equate the expected rates of return per period on all assets.

Under my assumptions, where $K^* = K$ before the increase in the stock of money, $A = \frac{K}{Y}$ for a given rate of interest; it is larger for rates below r_0 and smaller for rates above r_0 . The same relationship holds for $\frac{K^*}{Y}$. This means that the assumption of a given ratio of the desired capital stock to expected income associated with holding interest rates constant will tend to bias the analytical conclusions towards a lower value for the responsiveness of desired investment spending to a change in income. Because desired saving may vary directly with the rate of interest, holding rates constant will tend to overstate the responsiveness of desired saving to the initial change in income and its associated decline in interest rates, thus biasing the results in the same direction. These biases work against my case.

Thus, if

$$dY = f(dM),^7$$

$$\frac{\partial K^*}{\partial Y} = A,$$

$$\text{and } \frac{\partial I}{\partial K^*} = B,$$

$$\text{we have } \frac{\partial I}{\partial Y} = \frac{\partial K^*}{\partial Y} \frac{\partial I}{\partial K^*},$$

$$\text{or, } \frac{\partial I}{\partial Y} = (A) (B).$$

$$\text{Because } A = \frac{K}{Y} \text{ when } r = r_0, \frac{\partial I}{\partial Y} = (B) \left(\frac{K}{Y}\right).$$

7. Note that income can also change initially because of other factors.

Therefore, the IS curve has a positive slope if $(B)(\frac{K}{Y}) > \frac{\partial S}{\partial Y}$, where $\frac{\partial S}{\partial Y}$ is the marginal propensity to save, holding interest rates constant.

Consider high and low guesses regarding the values of B and $\frac{K}{Y}$ in the U.S.; for B 0.4 and 0.1 and for $\frac{K}{Y}$ 3.5 and 2.5.⁸ Pairing the high and low guesses for each variable we find that the entire range for $\frac{\partial I}{\partial Y}$ of from 1.40 to .25 may well be higher than $\frac{\partial S}{\partial Y}$ which is usually taken to be in the neighborhood of a range from 0.1 to 0.2 when expenditures for consumer durables are included in the consumption function. In other words, under these assumptions it is not unlikely that $\frac{\partial I}{\partial Y} > \frac{\partial S}{\partial Y}$, which is to say, that the IS curve has a positive slope.

What prevents the economy from exploding, even under these highly restrictive assumptions? It is essentially the limitation placed on the expansion of income by the fixed money stock plus the relative interest inelasticity of the demand for money. As income and interest rates rise there may be some increase in income velocity, but it will not be sufficient to permit income to expand indefinitely. Moreover, the rise in rates will dampen desired investment and encourage desired saving until the two return to equilibrium. If, however, the demand for money is sufficiently interest elastic so that the slope of the LM curve is less than the slope of the IS curve, velocity would be more highly sensitive to interest rates, tempering the rise in rates. Thus interest rates would never rise fast enough to overtake the investment-

⁸For more precise estimates see A. Harberger, The Demand for Durable Goods, and S. Kuznets, Capital in the American Economy.

saving disequilibrium. Moreover, even if the demand for money were highly interest inelastic, this system may still explode if the IS curve had a still lower interest elasticity. In the case of the stable system, if the monetary authorities continue to increase the stock of money, possibly in order to keep rates from rising or because of devotion to some form of the "real bills" doctrine, income would continue to expand and equilibrium interest rates would be still higher.⁹ (Rates "pegged" too long will cause the system to explode.)

Perhaps much of the essence of business cycles has been set aside in the assumptions I have made to isolate some of the mechanisms of short-run fluctuations. In modifying or relaxing each of them we can see other forces containing and shaping the apparent cumulative forces in booms and recessions, even granted the simplifying assumptions regarding homogeneity among industries and a given technology. First, the supply of labor cannot long be taken as infinitely elastic at the money wage rate, particularly in the face of a substantial reduction in unemployment. If the expansion progressed far enough or long enough one would expect to find wage rates rising in both money and real terms, increasing variable costs and reducing incentives to change the ratio of labor to capital which was the source of the desired expansion in capital goods in the first place. Second, the supply schedule of capital goods cannot long be taken as infinitely elastic either, particularly in the length of run covered by a typical business cycle, so that a substantial shift in the demand for capital goods would lead to higher

9. Thus, it would seem that those who hold that multiplier and accelerator values are large may need the Quantity Theorist's traditional assumption of a low interest elasticity of the demand for money to keep their formal systems from blowing up--or down--but not vice versa.

prices, postponements, etc. Third, additions to the stock of capital would change factor proportions and lower the productivity of capital. Fourth, the assumption of static expectations may bias the analytical conclusions in the direction of making some elements of the theoretical system even more subject to instability than they, in fact, are. For example, if the initial rise in income is viewed as largely temporary, desired investment will be lower and desired saving will be higher than if the same change in measured income is taken to be a permanent change. If, however, the demand for money is a function of permanent rather than current income, small changes in the stock of money will have greater consequences for spending, and changes in income will be associated with smaller changes in the quantity of money demanded. At this point it is difficult to see what the net analytical bias is for the aggregate or for the mechanisms I have discussed.

In addition, the initial capital stock may not be the desired one. If, before the disturbance, the desired capital stock was greater than the actual stock, the same analysis would seem to follow. However, if the desired stock was less than the actual stock, a not unlikely deep-depression phenomenon, the increase in the productivity of capital may merely bring the two somewhat closer together but not spill over into a shift in the demand for additions to the stock. In other words, perhaps $\frac{\partial I}{\partial Y}$ was so low during the 1930's that the IS curve generally has a negative slope at that time. (The same factors may also have made

investment relatively unresponsive to changes in interest rates too.) More recent experience with long periods of relatively full employment conditions may be consistent with a positively sloped IS curve.

Further, in moving to a more powerful and general analysis undoubtedly one must also take into account more explicit roles for lags, adjustments, expectations, and more complex dynamic and other interactions.

A positively sloped IS curve and the adjustment processes generating it may also explain the procyclical behavior of measured income velocity. If, as this analysis indicates, monetary expansion leads to increases in both income and interest rates, and if the demand for money is inversely related to nominal interest rates, then it follows that rising interest rates resulting from monetary expansions will cause velocity to rise and declining interest rates following monetary contractions will cause velocity to fall.

These patterns would appear to be consistent with the observed empirical business cycle regularities that money, interest rates and velocity all tend to be procyclical, with money tending to lead business cycle turns and interest rates to lag them. These mechanisms not only explain why an expansionary monetary policy generally leads to an increase in nominal and real interest rates but also why an expansionary (contractionary) increase (decrease) in the stock of money causes velocity to rise (fall) as well, thus amplifying the initial impact of monetary change on aggregate nominal expenditures.

Finally, let us briefly consider elements of several analyses which crucially depend on the assumption of a negatively sloped IS curve. First, many critiques of the contribution of the monetary authorities to

cyclical change generally come down to attempts to identify which of the schedules has shifted. If the IS curve is taken to have a negative slope and if the monetary authorities are understood to affect the LM curve, it looks easy indeed, and even intellectually defensible under many circumstances, to point to high interest rates in booms and low interest rates in recessions as stemming from shifts of the IS curve, not the LM curve. It is no less difficult to interpret interest rate changes or credit market conditions as consistent with stabilizing shifts of monetary policy towards "tightness" in booms and "ease" in recessions when, in fact, high interest rates of booms and low interest rates of the recessions more accurately reflect the high or low productivity of capital and the good or poor business conditions brought about by the procyclical change in the money supply. This confusion is one of several reasons why the stock of money, not interest rates or credit market conditions, is the appropriate policy variable for the monetary authorities and for any critique of their effectiveness.

Second, the assumption of a negatively sloped IS curve is a central feature of many analyses of balance-of-payments adjustment processes.¹⁰ This assumption helps to provide the theoretical basis for the presumption that monetary policy must take into account an inevitable trade-off

10. For example, see R.A. Mundell, "The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability," I.M.F. Staff Papers (March, 1962).

between the quantity of money and interest rates, and perhaps between income and interest rates. It leads to the conclusion that expansionary monetary policy will deteriorate a country's balance of payments on capital account, especially in a regime of fixed exchange rates. My analysis suggests that this conclusion may be in error; if so, an error of serious consequences. No doubt the initial effect of more money is to lower rates. But, by ringing down the curtain after the first scene in the drama, the standard analysis neglects the remainder of the story.

We would do well to recall that pursuit of a restrictive monetary policy in 1931 in order to raise interest rates for the purpose of moderating the U.S. balance of payments deficit and external gold drain, by causing the ensuing economic collapse, lowered interest rates for many years thereafter. More recently, repeated attempts to lower interest rates by expanding money have been major factors in the contemporary era of inflation and high interest rates.

Mr. NEAL. Please, if you would, take a look at our exhibit. It is self-explanatory. I find the conclusions mapped in the exhibit astounding. The public debate has centered around fiscal policy almost entirely, it seems to me. Yet these charts indicate that monetary policy has had a much greater impact on inflation and recession. Several of you alluded to that in your testimony.

How about just commenting on the chart? Do you see any problems with it? Is it inaccurate, in your opinion, in any way?

Would it bear out what your experience is? Mr. Perry?

Mr. PERRY. The chart has several parts. In the first place, the chart on the budget deficit clearly points out that deficits are not quite the scary thing that they are sometimes made out to be.

The fact is that the big swings in the budget are largely induced swings. They are not changes that represent active movements in the budget designed to move the economy in a particular way. Rather, they reflect the automatic stabilizers of the budget. This is very clear today when the huge deficits we are looking at represent a weak economy with its reduced levels of profits and income rather than any great runaway spending propensities on the part of the Congress or the administration.

So the budget deficits as actually experienced mainly mirror the health or the lack of it in the economy rather than anything else and that fact is shown up clearly. In particular, they don't show the sort of correlation that the public frequently imagines between inflation and deficits.

Mr. NEAL. In fact, quite the opposite.

Mr. PERRY. That is right. You get the huge deficits when you have a very soft economy, when markets are weak and therefore when the pressure on prices is at a minimum. Furthermore, inflation raises Government revenues. It is not a particularly good way to raise them but it has that effect and therefore you get the healthiest looking budget surpluses at times like 1973 when the economy is strong and we have some inflation.

I find the other aspects of the chart, in particular the apparent connection between money supply growth rates and inflation rates, somewhat misleading. Let me outline what I see as the relation of money growth and inflation.

There is a well-established relationship, wedded in theory and documented again and again empirically that the higher the price level, the correspondingly greater the demand for money. If the price level were 1 percent higher this year, everything else being equal, the demand for money in the economy would be 1 percent higher.

As inflation proceeds, whatever its source, the Fed is faced with the fact that the demand for money is larger. It has one of two choices. It either accommodates that extra demand for money, keeping the real impact of monetary policy unchanged, or it refuses to accommodate it and thereby tightens the real impact of the money supply on the economy.

If, as in 1973, and 1974, you got an extraordinary burst of inflation and the Fed did not accommodate it at all, pursuing the same monetary policy it would have in the absence of that inflation, then in real terms, monetary policy will have severely tightened.

Historically it has always confronted this choice, whether Federal policy was conducted by a feel of the market, whether it was oriented to interest rates and the housing industry, or whatever, it could not avoid the choice to A, accommodate the inflation, whatever it may have been at that moment or B, if not accommodate it, tighten money in real terms.

I think this is basically what we see reflected in these historical relationships.

Mr. NEAL. Perhaps I did not point it out, but there is a time lag of 23 months between the rate of inflation and the growth in the money supply.

Mr. PERRY. I appreciate that but these are smooth series and by and large what I think we are picking up is a rather substantial trend in the two that is common. If we look at—

Dr. WEINTRAUB. If we dropped every month but January for prices and every month but February for money and then let the first differences in prices be related to the first difference in money two Februaries ago, we get the same results.

So although you are quite correct that the way this experiment was formed, there is obvious serial correlation. The same result occurs if you just use one month and without serial correlation.

Mr. PERRY. That's not enough. Let me just say that the rate of inflation very gradually increases and though we can find a place it peaks, by and large it is gradually increasing. It is not that you have cycles and can identify lags very sharply with them. The other thing to note is that money influences future inflation; but in a different way than is implied by the chart.

Dr. WEINTRAUB. I think if you look at the chart, you will see that the inflation rate has subsided as well as gone up in the period since 1964. Although there is a trend, there is a roller coaster pattern around the trend.

Mr. PERRY. If you put the real state of the economy into an equation—

Dr. WEINTRAUB. We have done that.

Mr. PERRY. And you do a conventional attempt to explain inflation—relying on how tight the market is, what is the history of inflation—you don't add to the explanation by adding the past money supply.

Since money matters very much in determining GNP, you will still get relationship between monetary growth and the subsequent inflation rate but you will not get a relationship that, as sometimes is suggested or implied, operates without affecting the real economy.

I would like to make this point as clear as I possibly can. Monetary policy matters very much. If monetary policy is very expansionary and pushes the economy very far very fast, the consequences of that will be more inflation. But the inflation arises because the real economy has been pushed too far too fast, not because of any magical property of the money supply.

Mr. NEAL. What pushes the economy too far?

Mr. PERRY. It can be any number of things. It can be a boom originating in the budget. I think when defense spending in the budget in 1966 suddenly stepped up sharply, we were pushing the economy basically because of fiscal policy. It could also be a surge in demand from monetary policy or from the animal spirits in the private sector.

Mr. MEISELMAN. Why was there a recession in 1966?

Mr. PERRY. I am not aware there was one.

Mr. MEISELMAN. There was a recession at the end of 1966 and the beginning of 1967.

Mr. PERRY. There was a slowdown but it has never been called a recession before to my knowledge. But the point is not that monetary policy isn't very potent and that monetary policy does not track GNP very well and therefore is not closely associated. The point is, whatever our real goal—an unemployment goal or an output goal, we do not choose between achieving it without inflation by making the money supply grow slowly or achieving it with inflation by making the money supply grow fast. Rather, we have to concern ourselves with what it is that makes the economy inflation prone and try to deal with that. If we succeed, then we can resolve the dilemma between output goals and inflation goals. We don't resolve that dilemma by pretending that the particular setting of a dial on money growth rate is going to solve it for us. That will just give us a particular combination of inflation and output.

Mr. NEAL. Mr. Jordan?

Mr. JORDAN. Thank you. This is a very interesting discussion, in part because we have been through it before.

I would like to go back to 1966, 1967 and 1968. 1966 was a year of very expansionary fiscal policies by most conventional measures. There was a sharp contraction in the rate of monetary growth in the last 9 months of that year. Some people said the economy would be strong at the end of 1966 because of fiscal stimulus. Others said that, in view of the slower monetary growth, we were going to have rising unemployment and maybe a recession. We did have a sharp contraction in output in the first quarter of 1967, as is shown on my chart I. It was not considered long enough by the National Bureau to be called a real recession, so it was referred to as a mini-recession. Then the argument was advanced that restrictive monetary policy could slow the economy in spite of the expansionary fiscal policy, but "you can't push on a string." Rapid monetary growth can't keep the economy going if you have restrictive fiscal policies.

The test of that proposition came in the second half of 1968. In 1968 you had a very rapid growth in the money supply. The Federal Reserve kept talking about restrictive monetary policy as measured by the level of interest rates. The public record shows that they voted for restrictive policy, but they felt it was restrictive because the level of short-term market rates was rising even though the money supply was growing very rapidly.

We had a surtax that year. President Johnson imposed a 10-percent surtax on personal and corporate income, and a reduction in the growth of Government expenditures. There was concern about overkill of the economy because of the fiscal restraint. The Federal Reserve decided to offset, in part, the fiscal restraint through monetary ease. The money supply kept growing rapidly, interest rates declined in the second half of that year, and we continued to have a strong economy.

It was only in 1969, after the Federal Reserve moved to a sharp contraction in the growth of money, did you get true restraint that brought about the recession in 1970. Then, in 1971 and 1972, we had expansionary monetary policies.

Now people are telling us that rapid monetary growth would not spill over into a new round of inflation until we reach some threshold of full employment or full capacity by the conventional measures. They argue that we have a sufficient amount of slack that we don't have to worry about a danger of excess demand causing inflation until we get to a higher level of employment and capacity. My argument there is that this comes from a view that most of the oscillations in the economy were due to accelerations and decelerations in demand relative to supply. Aggregate supply was viewed as growing at a steady trend rate. If this excess capacity and high unemployment had been caused only by a contraction in aggregate demand, then the appropriate cure would be to expand aggregate demand, to put the people and the capital back to work.

Most of us agree that the shocks to the economy during the last few years came initially on the side of supply, the failures in agriculture in 1972 and 1974, the devaluations of the dollar, and especially the quadrupling of energy prices. Energy is an important input to production at all levels as well as being a consumer good. This reduced our real economic capacity, our ability to meet demand, to produce goods and services profitably at prevailing output prices. The basic phenomenon was much like the Irish potato famine. It was a contraction of the real economic ability of the economy to produce, relative to the demand, at a time when demand continued to grow.

The reason we had a sharp acceleration in inflation and a sharp drop in real output was not because of restrictive monetary and fiscal policies, but because we had a contraction in the real economy.

That leads me to believe that the capacity utilization numbers that we see, and the so-called gap between real output and potential GNP, are misleading. We cannot return to producing at those former rates and volumes of output, given the much higher cost of production associated with the cost of energy and also because we are devoting more of our resources toward social goods. We want to close the gap between the social costs and private costs of production. We want to clean up the air and the water, provide safer working environments and safer products, and that takes resources. Because of this, we should not try to push the economy back toward the levels of output that we saw a few years ago.

It is my view that our upper limit on real economic capacity is closer than the conventional measures indicate, and we are in danger of tipping over into a new round of inflation if the Federal Reserve were to expand the money supply rapidly to try to get unemployment down too quickly.

Mr. NEAL. Let me ask you, if I can, to comment on the chart specifically. Do you have any problem with that relationship between money policy and inflation?

Mr. JORDAN. No; I don't at all. The basic relationship is one that I think is correct.

Mr. NEAL. Let me make very clear that if there is another element that we ought to have in the equation, we want to get it in there. Mr. Perry?

Mr. PERRY. Mr. Jordan has said much that I agree with. I did not say we have no inflation ahead for a long time. I think I said we have a choice between being more vigorous in our pursuit of output

and employment goals and thereby taking the risk of more inflation, or going the other direction.

Mr. Jordan pointed out carefully and clearly that it is a question of what capacity is in the real economy, of what cost increases are coming from conditions the real economy that is going to govern how far we can go before running the risk of a lot more inflation. That is precisely the way I would analyze the problem myself.

I would remind you that that analysis he gave you did not say the rate of growth of M_1 causes these real capacity problems that he is worried about. Those happen from real things in the economy and they should be analyzed that way.

The relationship I think you should be looking at here in place of the one that relates simply M_1 to the inflation rate is one that deals with real economy capacity problems, both of labor and capital, and then tries to see whether, knowing what you do about those things, the sort of things Mr. Jordan was talking about, you get more information by putting money in one of the equations. Some attempts to do this appeared in recent articles by Modigliani and Papademos and by R. S. Gordon in Brookings Papers on Economic Activity in 1975.

The point I am making is not that M_1 is not very important in this process. The periods when we have run ourselves into inflationary situations have usually been periods when M_1 has grown rapidly. In growing rapidly, it pushed the real economy up fast and far and ran us into inflation.

That is the distinction that I am trying to make. There is not a magical relationship between M_1 growth and inflationary problems. M_1 growth is associated with how far and fast the economy is going at any point in time.

Mr. NEAL. Mr. Fiedler?

Mr. FIEDLER. I would like to comment on the relationship between money and inflation by drawing a distinction between the short run and the long run and also by distinguishing in what may be partially an artificial way, but nevertheless valid, between three types of inflation.

One I call a basic built-in rate of inflation. It represents an accumulation of past experience reaching back a decade and more, often related to bad economic policies over the longer term. Second, a cyclical inflation, an acceleration or deceleration of that basic built-in rate of inflation, depending on the degree of resource utilization, whether we are in prosperity or recession.

Third, special factor inflation, the kinds of food, fuel, devaluation, and price controls events that have temporary impact—events that are big enough and important enough to have an impact on the overall rate of inflation but one which is essentially temporary. I think this last component of inflation that I am talking about, special-factor inflation, is illustrated on your chart at least in part by the fact that your rate of inflation line, the red line on that chart in 1973–74, gets up well above the money line.

Those are sort of one shot impacts, or what we might call inflationary accidents. The distinction I want to make is that the relationship in the long run that you are referring to, it seems to me, is very well established.

There is a casual relationship, that is, the more rapid rate of increase in money over any decade is clearly going to be reflected on the average over that decade in a more rapid rate of price inflation.

I think most of the testimony you have heard here today is consistent with that long-term kind of relationship. Then in the short run, what happens within a given year and whether the inflation accelerates from the base rate or decelerates, depends, it seems to me, on the questions of the sort that Mr. Perry has raised, such as how close are we to full utilization and what are the expectations of the economy.

It is important to appreciate that distinction between long-run impact and short-run impact. I would add that when we say that there is a casual relationship in the long run between money and inflation, we should also recognize that money is only the proximate cause, the mechanism through which inflation is created.

The original causes, the fundamental causes, it seems to me, are in the political and social goals that the people of America have that tend to cause us to try to achieve a great deal more than the economy has capacity to achieve in any short-run period.

We really have to go back to social and political things when we want to look for the reason why monetary growth does get too rapid in some periods and tends to impart that kind of an inflationary bias to the economy.

It seems to me that the 23-month lag that you have built into the chart is something that you should not view as a highly specific, accurate, precise kind of a thing. Certainly the lag is variable. In one business cycle, it would be longer, and in another business cycle, it would be shorter, depending on a lot of different things.

There is no magic in that relationship. Also I would like to comment on your conclusions that you have reached here tentatively. I am glad you are cautious about the conclusions. Your conclusion is that the deficit in the budget is much less important or less of a factor in causing inflation or recession. I have some doubts because it seems to me that we are dealing here with a situation where all of the factors—money, budget and inflation-recession—all react on each other and it is difficult to mathematically disentangle all the relationships.

The position of the Federal budget is important not only to what is happening to the economy but also—not necessarily more important but also very important—to what is happening to the supply. I mentioned in my testimony that there is a divergence now between fiscal and monetary policy stances. I also mentioned that most of the time those two move in concert.

Any time you can say that monetary policy has a relationship as close as this chart suggests to the rate of inflation, that would also suggest that fiscal policy has a role. How much the role of fiscal policy is independent of monetary policy and how much the role of monetary policy is independent of fiscal policy is something that I do not think our analytical tools are sufficient to properly disentangle.

There was some testimony by Secretary Simon about a year and a half, 2 years ago, if I remember correctly, before one of the Budget Committees that stressed the relationship between inflation and the budget deficits properly adjusted to what is known as the full employment or high-employment budget.

That testimony, it seems to me, stresses that there is an impact of Federal deficits that does not show on your chart and does not come out in your conclusion. You might want to test not simply the budget deficit in billions of dollars as you have here but look at that high-employment budget deficit.

There are many difficulties in calculating such a budget figure. But I think that would be a fruitful area for further research.

Mr. NEAL. We will certainly look at that. Do you see some problem with the way that we have shown this on the chart? Obviously there is no apparent relationship using the deficits. We might want to chart not only the deficits but the levels of the budget itself.

Mr. FIEDLER. I think that is correct. I would suggest that you look at—for example, try the budget calculated as a high-employment deficit as a percentage of GNP and see if that chart does not give you some correlation, not within the cycle but over a 5-year span.

Mr. MEISELMAN. In Mr. Jordan's article he asks a question involving what the separate effects of the stock of the money and of changes in the budget measured either by the high employment figures for expenditures taken separately or the figures on expenditures and taxes taken together.

The results of his research, which came as a great surprise to large numbers of people, was essentially that fiscal policy measured either way at most has only a very temporary and weak effect on GNP. Some research I did jointly with Milton Friedman several years earlier had come to much the same conclusion, and was also received with a great deal of suspicion and disbelief.

Both pieces of research provoked a huge amount of research.

There are many economists who are skeptical of the research findings, who felt there was something wrong either with the calculations or the analysis. It turned out that neither was the case. The main thrust still stands.

Mr. PERRY. I feel I should set the record straight on that. There is a good deal of analysis that disputes that conclusion. The most recent I have seen has been by Professors Blinder and Solow who reviewed it and found that fiscal policy is a potent instrument and monetary policy is a potent instrument as well.

Mr. JORDAN. Fiscal policy is a very important factor in determining the real economic growth over time, and how much of the economy is in the public or Government sectors versus the private sector. As economists we make suggestions to the lesser developed countries of the world, how they can use fiscal policies to tax current consumption and promote investment. Fiscal policy can have an effect on standards of living and on the distribution of income in society.

But what it cannot do is independently determine the level of prices unless you take account of the stock of money. You can finance deficits, or increase spending, either by selling the bonds to the people or by selling them to the central bank.

Mr. NEAL. There are two separate questions, is that right?

Mr. JORDAN. Right.

Mr. NEAL. All we are dealing with in this chart is the one question.

Mr. JORDAN. Right. Also you should ask whether it is possible to relate the size of the deficit to monetary growth. In a study a few years ago, we first tested the proposition to find out if you can make a

statement about fiscal stimulus if you ignored monetary policy. You cannot.

The second question is can you draw a relationship between the size of the deficits and monetary growth? There is an indirect link. The Federal Reserve formerly used a concept called "even keeling." When there was borrowing by the Treasury, there would be temporary upward pressure on short-term market interest rates. The central bank had a responsibility to steady the market. The way they did that was to buy securities in the market at the same time the Treasury was selling their securities, maintaining the prevailing level of interest rates. This was a dominant part of policy in the record for the Federal Reserve in 1967 and 1968. One of the reasons there was such expansionary monetary growth was an indirect result of the deficit spending associated with the Vietnam war.

Sometimes the fiscal influence is in the same direction as monetary policy. The important test is not where they are going in the same direction, but in opposite directions. The record is clear that where monetary and fiscal policies diverge and go in opposite directions, the monetary impulse will dominate. That was our conclusion from the experience in late 1966 and again at the end of 1968 where they diverged.

If you don't finance deficits by monetary growth you will not produce the kind of inflation we have had. If you have rapid monetary growth, even if you have balanced budgets or surpluses in the budget, you are going to have inflation. The growth of the money supply will determine the level of prices, independent of the size of the deficit.

Mr. NEAL. Would you agree with that, Mr. Perry?

Mr. PERRY. No; I would not. But I hate to keep repeating myself.

Mr. NEAL. It would be of great help to me in trying to understand this.

Mr. PERRY. Both fiscal policy and monetary policy can have effects on the level of demand and therefore the level of GNP. This is my reading of the most careful statistical analyses. It is also what you would get out of most of the carefully constructed large econometric models.

Granting that there are many ways for GNP to rise—strong fiscal policy, strong export demand from abroad and so forth—there are various ways that policy can pull in opposite directions. You can have a strong rise coming from one area and monetary policy can head this off. Monetary policy in that sense is potent.

It can confront strongly rising demands, refuse to supply the money that corresponds to the demand, drive interest rates up sharply, break the housing industry, cause a recession and the demands will not materialize. There is no disagreement on that point.

But now, granted that GNP can rise and can be influenced by a variety of factors, how that rise divides between inflation and real output is something which basically rests with an analysis elsewhere in the system, not with the question of how much M_1 accompanied that rise.

If the rise occurs, then you start asking how inflationary is it going to be. But whether M_1 growth is very rapid or not in the process of generating that rise is not the thing which tell you how inflationary it is going to be.

There really is quite—if one looks at it carefully, there is quite a lot of evidence of that in the chart before us. We have had a very modest sort of M_1 growth for the last 2 or 3 years and we have had historically huge gyrations in the inflation rate and in the real economy.

I think that I understand how much of this happened. My explanation does not rest on what was happening to M_1 . The rise in the price of oil caused a lot of price increases and it really is not true that OPEC read the St. Louis bank statement on M_1 growth before they did that. The rise in the price of food is a similar story. These things are a legitimate way to look at the huge inflation that we ran into. None of them had anything to do with rates of growth of M_1 .

Mr. NEAL. Our calculations indicate that money supply accounts for something like 60 percent of the rate of inflation. We see this jump in the rate of inflation over the money growth rate in the period that you mentioned earlier when there were dramatic increases in oil and food prices. Our chart captures these effects as well as the impact of money.

Let me ask now, would you say that monetary policy has been well administered over the period of time charted here? Whatever your answer is, what would be your prescription for the future?

Mr. JORDAN. I think that monetary policy in the post-war period was procyclical making the inflations worse than they would have been, making the recessions and the unemployment worse than they would have been.

My prescription would be stop trying to use monetary policy to solve problems, but to let it be the one steady thing that the real economy and other policies revolve around. That would be indicated by a steady rate of monetary growth. The first thing is to achieve steadiness and the next thing is to reduce the trend growth. The sharp fluctuations we have had have caused the fluctuations in interest rates and the housing market. I would not want to see us try and put the housing market through another quick feast-famine cycle by expansionary policies this year and restrictive policies next year.

Mr. NEAL. It was suggested by someone yesterday that we might want to arrive at a formula for the money growth. It would be something like a percentage measure of gross national product. If we said the GNP ought to be 5 percent, then the money growth ought to be 5 percent.

Mr. JORDAN. There should be a relationship between growth rate in the money supply and nominal GNP. You can make a projection of what the nominal growth of GNP will be in a year. We are concerned with what kind of economy we are going to have in the future.

What your chart shows is that with the 2-year lag, approximately, between inflation and money growth, you have to go out into 1978 to trade off the costs of more rapid money growth. If you expand money more rapidly now because you want more nominal GNP, how do policymakers evaluate whether it is worthwhile, a good idea, in terms of the higher inflation in 1978?

It is easy to say we will worry about that problem 2 years from now. Because of the long lag that your chart illustrates between inflation and money growth, it is very hard to make this judgment. I think because of our past experience with stop and go policies, swinging first to restraint and then toward expansion, I think we

should err on the side of more stable, slower monetary growth, and be willing to be wrong, rather than to err on the side of easier monetary policies like in 1972 and 1973 and pay the terrible cost of readjustment, both in inflation and unemployment, to get back down again.

We are starting this business cycle expansion with the highest level of ongoing inflation we have ever had. We continue to reach upward to higher and higher levels of inflation and interest rates.

That disturbs me to begin the expansion with this level of inflation built in, and to talk in terms of more rapid monetary growth and not worry about the implications a couple of years from now. The mid-points of the Federal Reserve's range would be adequate.

We would like to have the kind of expansion that occurred in the sixties. Fiscal was active, but monetary was stable. We did have a brief slow-down at the end of 1962. I do not see any prospects of that at the present time.

I think we have a chance for 1977 to look much like the early sixties. But there is also a risk it will look like 1971-72. We would prefer to have the sixties kind of expansion rather than the seventies kind of expansion. It depends almost completely on what the rate of the growth of money supply is this year.

Mr. NEAL. Mr. Meiselman?

Mr. MEISELMAN. The hour is late. I wish to note that I am in general agreement with Mr. Jordan's analysis. I would like to add that we now have a great deal of inflation already built into the system because of poor public policies in the past.

I believe the best way to achieve price stability is to eliminate the remainder of the inflation gradually, step by step, not abruptly. This would avoid the shocks that cause unemployment. I would start with the Federal Reserve's current target for monetary growth and recommend that it be lowered by something like 1 percent each year.

That means that several years down the road, we will be within the targeted range for monetary growth that I mentioned before, which, based on historic evidence, would give us stable prices.

Once we achieve stable prices, we should and can stay there by remaining in the range of moderate and steady monetary growth. I would urge the Congress and the Federal Reserve to resist vigorously any attempts to move outside that range. To do so would start this whole stop-go cycle again that does nobody any good.

Mr. NEAL. Mr. Fiedler?

Mr. FIEDLER. My judgment on the monetary policy of the past two decades is that it was very much better than the previous two decades. Monetary policy still left quite a bit to be desired and did, as Mr. Jordan suggested, on occasions make some things worse than they otherwise would have been.

The monetary policy has been part of the process over the past decade where we have had a continuous acceleration in this base, built-in rate of inflation where we have gotten up from the early 1960's of 1 percent, virtually zero and now we are up to 5 percent or 6 percent.

That is unfortunate, but perhaps we should have some sympathy for policy authorities who are dealing with very difficult processes which are not well understood.

As to the future, there was a suggestion in the prescriptions offered by both Mr. Jordan and Mr. Meiselman that we should pursue a very steady rate of increase in money and credit growth.

While I would like to see more steadiness in the future than in the past, I think we can carry that prescription too far. I do believe that at any given time, monetary policy must take account of not only some fixed, long term-goals, but also the short-term goals and that some kind of an accommodation does have to be made between those two often conflicting sets of goals.

The idea of gradually reducing the rate of increase in money has great appeal. I would not try to put it on a specific 1 percentage point a year basis. I would be very cautious in doing it at the present time.

At the present time, my own inclinations are for the upper range of the current Federal Reserve targets.

MR. NEAL. Thank you.

Mr. Perry?

MR. PERRY. I would say that monetary policy has been conducted reasonably well over the period you have charted. Its worse marks probably come during periods of recession when the Fed has allowed money growth to slow very sharply.

This has been a characteristic of all the recession periods we have had. It could have been fighting harder against downturns. In recent years, it has been confronted with impossible problems.

It has been asked to deal with inflation that it could not possibly deal with and the results have been very mixed. And, depending on how one views what is important, you can end up thinking the Fed has done very well or very poorly.

For now, there are two issues regarding monetary targets. One is that you still face the problem of inflation and unemployment and you are not sure exactly where you are going to come out on that. A year from now, we could be looking at 6-percent inflation. If so, low money growth rates could easily lead to another recession.

A second issue is that the money demand relationship has been wildly unstable over the past 2 years.

Money demand, based on the sort of estimates that most researchers work with, has shown enormous errors from past historical relationships which take account of the influence of interest rates and the influence of prices and real output on money demand.

The error that has accumulated is in the neighborhood of 8 percent over the last couple of years. You can shop around for an equation with a 7-percent error or another one that has a 9-percent error. But any of them is a huge error.

If the equation had been error-free, it would have required 9 percent more money today than we have gotten to achieve the same situation in the economy. We do not know whether the source of that error is going to unwind or reverse itself over the next year or two. It is possible.

Research has tried to track down where those errors have come from. Partly they have come from the fact that there are a great many substitutes for money and new institutional arrangements being made between banks and their customers.

We cannot predict the future of these, but if we tie ourselves to a number for a thing called M_1 and if some of these institutional

arrangements start to go the other way, the Fed could find itself driving interest rates through the roof and causing another recession in the name of sticking to an M_1 target when the demand for that thing called M_1 has reversed itself and gotten strong.

Therefore, I think what we ought to be doing is setting some kind of economic targets for the Fed and asking them to pursue those economic targets as best it can. If that means getting out of the target range on M_1 on the upside or the downside, then let it.

If the money demand function is very unstable, it is very important to look at interest rates. I think we are now in the period when monetary policy, all things considered, has been quite easy.

Interest rates are at fairly modest levels. A modest rise in interest rates would be appropriate. But if it turns out that, to hold an M_1 target, you have to drive interest rates up sharply, I would find that unjustified.

I think it is more important for the Congress to come to some understanding with the Fed about the economic goals that are being pursued and leave the nuts and bolts of how to conduct its operations more to the Fed itself. If what it is doing seems to be contrary to the economic goals, it should answer for its actions and explain why it has pursued the path it has.

I believe that is the most important oversight that the Congress could make of the Federal Reserve's activities.

Mr. NEAL. Thank you very much.

I would like to yield to the gentleman from Tennessee.

Mr. ALLEN. Thank you, Mr. Chairman.

Mr. Jordan, you mentioned some mismanagement in monetary policy in recent years by the Fed. Do you agree that the present economic recession was precipitated in large measure because of the tight money policy and the high interest rate policy adopted by the Fed about 2½ to 3 years ago. Was this what precipitated the downturn?

Mr. JORDAN. I would say "no" to the word "precipitated." The monetary policy remained quite stimulative until mid-1973. There was a moderate slowing from mid-1973 to mid-1974—in the appropriate direction, in my mind.

My third chart shows the relationship between the short-term rate of inflation and the level of short-term interest rates. There is a good correlation there.

What happened was, you had shocks to the supply side of the economy plus the after effects of wage and price controls in which prices were artificially suppressed. Inflation accelerated sharply in 1973. You had credit demand building very strongly in the economy, bidding up interest rates to high levels.

The contraction in output and moderate rise in unemployment we had through mid-1974 (up until August or September of 1974, I think) were not initially or primarily due to excessively tight monetary policies.

I do believe in the second half of 1974 that monetary growth contracted much too sharply, as is shown on my chart I, and was too late and too much. Monetary policy became overly restrictive bringing a demand induced recession right on the heels of a very severe contraction in aggregate supply. As a result, the recession was deeper and longer than it would have been if the Federal Reserve had not allowed this sharp contraction in the growth of the money supply.

Early in 1975, they turned sharply, growth of the money supply accelerated rapidly, and it has continued to be uneven and erratic over the past year. I guess the word "precipitate" I would not agree with.

Mr. ALLEN. You are arguing about semantics, really. When Dr. Arthur Burns was sitting in the middle chair there sometime back, I asked him the question about whether or not he agreed with the accepted premise of most economists that if we sought to bring about a sharp reduction in unemployment, that it would precipitate—I am using that word again—and rekindle the fires of inflation.

I asked him the specific question of whether or not he agreed with the economists who say that we cannot afford to have as our goal 2-percent or 3-percent or 4-percent unemployment.

His answer was, "I think that if properly handled, our goal should be zero unemployment so long as those who are employed are gainfully and productively employed."

In answer to my questions and suggestions, he agreed that if they are gainfully employed, it would offset any inflationary pressures. Those words came from Dr. Arthur Burns.

I am asking you gentlemen here what do you suggest, monetary policywise or otherwise, that we can do to substantially reduce unemployment and put back to work in gainful and productive employment the millions of people today who are unemployed, many of whom are being paid money not to produce but simply to consume, which, of course, is obviously an inflationary force in our society, being given spending power for not producing.

That, I guess, you agree, is inflationary. If, for what you receive in wages you are producing in services or commodities that are being on the market for sale, then it is not inflationary.

Now, this is what I want to know: What approach do any one of you gentlemen have to suggest about getting at the root cause of our whole problem and that is getting back to work the millions of unemployed in this country into gainful and productive employment?

To my mind, you talk about wasted government money. The most indefensible waste that is going on in this country today is the failure of this economy and this society to utilize to the fullest the talents and the energies of all of its people who are able to work and contribute to the wealth of this Nation.

Do any one of you gentlemen want to respond?

Mr. MEISELMAN. Congressman, I would like to comment on that. I think it is important when you are talking about reducing unemployment that we be very clear about the means that we select to achieve that end.

There are certain things that monetary policy can do and certain things it can't do. As I discussed in my prepared testimony, belief that speeding up the printing press would put people to work has been one of the primary sources of the inflation and also the rising unemployment.

This policy does not work, even though initially and temporarily there may be some additional jobs. The main goal of monetary policy ought to be the achievement of stable prices. If there is excessive unemployment, we have to ask ourselves very serious questions about conditions in the labor market rather than focus almost exclusively on monetary and fiscal policy.

Why is it that we have so many people who are not working? Millions of people are out of work, not because of the dislocations of the business cycle, but because of permanent changes in the incentives to work or to hire labor that have resulted in a permanently higher level of unemployment.

If you want to get into these tremendously important questions of the labor market—you must have to think along these lines. For example, the Congress has passed large numbers of bills that essentially pay people more not to work. Consequently, fewer people want to work. Congress has also passed large numbers of bills which make it more expensive to hire people.

When you put the two together, there are going to be more people out of work. For many people it just does not pay to work. In fact I keep a running poll among my economist friends and colleagues to ask them to explain to me not why the unemployment rate is so high but why are so many people working in this country? Under current incentives, that is the intriguing intellectual puzzle.

Mr. JORDAN. The first thing that should be done would be to decide not to use aggregate demand policies, not to use stimulative overall monetary policies and to rely on that to achieve it. Don't leave it to the Federal Reserve to promote those goals. Don't use the shotgun. Let's use the rifle approach. Find out who the unemployed are, where they are, and provide job training and relocation of workers. Also, exempt teenagers from the minimum wage or have a special lower apprentice minimum wage until they get some experience, and get people employed.

The national rate of frictional unemployment is about 3 percent. I have no problem in thinking in terms of a 3-percent unemployment rate. What I do have a problem with is trying to achieve it this year or maybe even next year through excessively rapid monetary growth.

Mr. ALLEN. I am not suggesting that in any way. I am asking you how do we go about it. You are the economists.

Mr. MEISELMAN. I believe that unemployment compensation is too high for too long for too many people. That is a huge incentive for people not to work. It is a huge incentive for employers to depend systematically year after year on people working part of the year.

We are subsidizing seasonal employment and seasonal unemployment.

Mr. PERRY. Have you looked at the unemployment statistics before unemployment compensation was invented? We had unemployment then and before we had welfare. This is not what causes unemployment. You had rates much higher then in the postwar period 50 years ago.

Mr. FIEDLER. I would like to offer some suggestions. Since the end of 1974 general public economic policy, fiscal and monetary policy has tended to be expansionary in an effort to reduce the unemployment associated with the recession.

The unemployment rate has come down a good ways. There is still a good deal farther that we can go by the use of those positive, stimulative money and fiscal policies. What we have been arguing today is how fast we change. But it seems to me there is further cyclical expansion that can take place and is taking place that will reduce the rate of unemployment and my tenuous guess is that we can get the unemployment rate down to 5½ percent to 6 percent by that means.

I would encourage us to avoid trying to do too much too fast for fear of undoing what we are accomplishing that way. The second suggestion I would have relates to my point in my testimony about the imbalance that now exists between capital and labor where there is not enough capital stock and capital facilities particularly in the major materials industries to permit the economy to operate in a way that would get unemployment down to where it could otherwise be before it would run into the bottlenecks associated with the labor market itself.

I would think that a program that would foster rapid capital formation over the next 5 to 10 years would permit us to take that 5½ percent unemployment rate and reduce it to 4½ or maybe even 4.

The third point I would try to do simultaneously with these others, is several structural measures to which there has been reference here, a separate minimum wage for teenagers, some change in the unemployment insurance system, perhaps making that compensation taxable, a negative-income-tax type of welfare reform with a careful look at the disincentives to which reference has been made.

I don't think those reforms can do a great deal. Maybe they can lower the unemployment rate by a few tenths. That is still worth pursuing.

Fourth, further experimentation with manpower training. We are spending about \$5 billion per year for manpower training in this country. There is no evidence to my knowledge that those programs have been particularly successful in achieving the provision of the unskilled with the skills to be productively employed in today's economy.

But we should keep trying. We should keep trying to shape those manpower training programs to hopefully be able to achieve that. We should not give up. I don't think we should have any major expansion of them, but I think we should not give up in those efforts.

Finally, I would echo the point that I think Mr. Meiselman made a minute ago that we should not attempt to get to zero unemployment because there is such a thing as voluntary unemployment that shows up in the unemployment rolls, people changing jobs, willing to work in seasonal trades that mean they are unemployed for part of the year, willing to take extra time off between jobs. That is one of the measures of the success of our economy, the high standard of living that the American people enjoy. We should not be shooting for zero.

Mr. ALLEN. I don't think Dr. Burns meant that every single individual who was able and willing to work should be working 5 days a week 52 weeks out of the year. He meant that our objective should be that every person who is able and willing to work should be able to find gainful and productive employment in this society.

And to the extent that this society and this economy does not provide that opportunity to that extent we are failing.

Mr. FIEDLER. I agree, sir.

Mr. ALLEN. Now with respect to inflation—of course, inflation is devaluation of the dollar. Devaluation of the dollar is devaluing, of course, the amount of the outstanding debts. Is that not true?

Mr. JORDAN. It is reducing the real debt; it is an indirect hidden tax on the consumer.

Mr. FIEDLER. It devalues the money that is in circulation.

Mr. ALLEN. Is it not true this society's present financial system—I am not speaking about just the Federal Reserve but our whole financial system is predicated on the proposition that the assets of insurance companies and banks and savings and loan associations and all the rest must increase year by year.

Do you agree with that?

Once you find particularly let's say insurance companies whose assets are not increasing, you have got a danger flag in that that insurance company is heading for real financial trouble.

Isn't that true?

Mr. JORDAN. The principle you are referring to is involved in pension funds and in the New York City problem. It is also involved in the social security system of the United States, in the sense that you are drawing in new participants and new contributors faster than you are paying the recipients.

Mr. ALLEN. All the assets of these financial institutions are in one form or another debts of society to those financial institutions. Isn't that true?

Mr. MEISELMAN. That is why interest rates rise during inflation to adjust to that loss, to gain on interest account what is lost on capital account.

Mr. ALLEN. But when a portion of the price of everything must be calculated to take into account interest and also to put back into circulation the money that goes into insurance premiums and savings and loan associations and so forth, in order to get that back into circulation, society has to go deeper and deeper in debt by going back to these same banks and pension funds and reborrowing the same money we put in it at interest.

Isn't that true?

Mr. JORDAN. It is, but the interest rate on that borrowing depends on everybody's expectations about inflation. When a financial institution agrees to lend someone some money, the interest rate it is charging reflects expectations about inflation. If it turns out that inflation is more rapid than they expected, the value of those assets—the market value—declines.

Mr. ALLEN. In view of this, is there any way we can operate and function without going into a catastrophic depression except by a moderate rate or an ever increasing rate of inflation, thereby devaluing the debts to devalue the dollars and the currency in which those debts are payable?

Mr. FIEDLER. I don't agree at all with that proposition. It seems to me we will incur more debt as the economy grows. There is every reason to do so. It is part of the process of saving and investment that is a fundamental component of our progress, a fundamental part of the increase in productivity, efficiency and the standard of living of the American people.

There is no reason that that debt has to grow more rapidly than the total economy and no reason that therefore has to produce any catastrophic consequences.

Mr. ALLEN. In other words, you think we can function prosperously in this society with zero inflation. Is that what you are telling me, sir?

Mr. FIEDLER. Yes, sir. I think we can function prosperously with 5 percent inflation or minus 2 percent inflation. I don't know how far I would want to go out, but there is a considerable range, I believe, in which we can operate because people do in fact get used to a continuing rate of inflation.

It seems to me that for the most part our economy presently is used to a built-in rate of something on the order of 5 or 6 percent. Most people are compensated for it. Social security is indexed and we can get along.

Mr. ALLEN. Social security and other obligations are going up. Wages have to go up. The entire cycle is over every time the wheel turns over, we have higher prices, higher wages and thereby reduce the debts to the extent that the value of the dollar in which those debts are payable is devalued.

Mr. FIEDLER. Yes, sir. But the higher interest rate being paid on those debts compensate. If I am a lender and lend you \$1,000 and you pay me 7 percent interest and we have 5 percent inflation, I am getting that 5 percent inflation back plus 2 percent real interest.

I am willing to do that, as a general proposition.

Mr. JORDAN. The volume of debt—both Government and public—and the interest rate associated with that debt tell us something about our economy, our society's preferences and choices about current consumption and consumption in the future. You are identifying a long-run problem of future liabilities of these institutions at a time when Government policy has been geared toward encouraging people to spend and consume now. The tax rebate and the other policies we have had show this. They are saying "don't preserve for the future, but go ahead and live it up now and let the future worry about itself."

But the high interest rates that the financial institutions are demanding is a way to try and bid the funds away from doing what Government policy has been trying to encourage people to do in the first place. If the inflation rate turns out to be less than the market has expected and discounted, the financial institutions would find that they are better off. In the past, they were worse off year after year finding inflation was worse than they had planned on, and they kept trying to recoup and catch up with this. We could be on the other side of that and have less inflation than the markets expect and they will find that they are in an improved position and better able to meet their liabilities.

By so doing it would be an indication that the behavior of the people of the country has become more conservative, that we have gotten away from the attitude of the sixties, that we will have guns and butter and therefore we won't have investment.

We are concerned about our future, about capital formation, about the growth of standards-of-living in the future, and not just our consumption this year. That would be a very healthy thing. In that way I think we could return to both stable prices and viable financial institutions with a much lower level of interest rates.

Mr. ALLEN. I am interested in reducing the interest rates by whatever means necessary, because interest rates affect prices and it is compounded five times by the time it gets to the merchant's shelf. But do any one of you economists have in your minds the round figures of the latest census study or study by any other agency of the Federal Government of the total appraised value or the total value of

all tangible property in the United States as against the total public and private debts and how they compare?

Do any one of you have those figures?

Mr. FIEDLER. No, sir. I can't remember them, Mr. Allen, but The Conference Board has just published a study on the national wealth of the United States. I may have something in my bag. Dr. John Kendrick, consultant to the Board has published a study. There is certainly some information along that line.

Mr. ALLEN. Would you expect to find that the total public and private debt far exceeds the value of all the tangible property today?

Mr. JORDAN. That would surprise me.

Mr. ALLEN. I am speaking of the tangible wealth.

Mr. MEISELMAN. It would not surprise me at all because there are many kinds of debts that are counted over and over again. So, in fact you counted all the debt, my hunch is that it is substantially larger than the tangible assets.

For example, if I have a mortgage on my house and if I got the mortgage at a savings and loan, that is one debt. At the same time the savings and loan borrows it from other sources. The other side of the balance sheet of my mortgage may well be a whole string of debts as people borrow and lend to finance the mortgage.

The same would be true if I financed the purchase of a car. You could have a sales finance company that has the paper, the sales company borrows from somebody else who in turn borrows from somebody else.

There is an elaborate financial network. I believe it is impossible to measure all those numbers. Twenty years ago when I was a young researcher at the National Bureau of Economic Research, we tried to do that. We did the best we could but at that time we didn't even get the total debt.

Even official U.S. statistics cannot calculate the total debt. There is always double or triple or quadruple counting. Unfortunately, many people who look at the statistics come away with the impression that there is an excessive amount of debt because the ratio is overstated.

Mr. JORDAN. When making that comparison you would want to net out all triple counting of the debt.

Mr. MEISELMAN. Once you start netting out double counting there is no good way you can draw the line. At one extreme, private debt is essentially zero, we owe it to ourselves, That is why some people conclude, if net private debt close to zero, don't worry about it.

Mr. FIEDLER. There is a summary of the study I mentioned a moment ago printed in the May 1976, "Morgan Guaranty Survey" the monthly letter. I will, with the chairman's permission, submit that for inclusion in the record.

[The summary of the study submitted by Mr. Fiedler follows:]

[From the Morgan Guaranty Survey, May 1976]

CONSTRUCTING A BALANCE SHEET FOR THE UNITED STATES

A national balance sheet for the United States combining the tangible wealth estimates with financial asset and liability data prepared by the Federal Reserve Board has been constructed for 1973 and is presented in the accompanying table (balance sheets for other years have not yet been completed). Holdings of domestic U.S. financial assets are shown by major categories, along with a single figure representing U.S. ownership of foreign financial assets, including U.S. equity interest in direct investments abroad. To these are added monetary gold and domestic tangible assets comprising inventories, structures, equipment, and land,

in order to obtain total assets. From these are subtracted liabilities and corporate equities (since stock values were included with assets) in order to calculate net worth.

The domestic financial assets and liabilities to U.S. residents cancel one another so that national net worth equals tangible assets, plus monetary gold, plus net foreign assets (financial claims on foreigners less foreign claims on U.S. residents). This is what economists understand as national wealth. On the one hand, it is the net worth of the nation. On the other hand, it is the productive tangible resources of the country plus our net claims on the productive resources of other countries. The equality between net worth and productive resources at the national level is, of course, not matched by equality in individual sectors. The personal sector's net worth is generally larger than its tangible assets, since its financial claims exceed liabilities. The opposite is true of business which is a debtor, on balance.

To be consistent with gross national product (GNP), which is valued in market prices or approximations thereto, national and sector balance sheets and the tangible wealth components must be valued likewise rather than at acquisition or original costs as is customary in corporate balance sheets. In the case of tangible assets, land is valued at market prices. Inventories have been revalued from book to current market replacement costs. Newly purchased equipment and structures are valued at market. But since most aging fixed assets are not traded in organized markets, their values are estimated in terms of depreciated replacement costs as a proxy for market values. Theoretically, market values represent the present (discounted) value of the expected net income from the capital goods over their lifetimes. Obviously, depreciated replacement costs are only a rough approximation of true values. Also, for purposes of relating capital to production, we estimate capital on a gross basis (that is, with no subtraction of depreciation), since the current productive capacity of fixed assets generally does not decline in step with depreciated value.

Real wealth (i.e., wealth in constant prices) grows as a result of saving and investment. In the case of depreciable capital goods, the change in net wealth between successive dates equals gross investment less depreciation charges during the period; the change in gross wealth equals gross investment less retirements (all in constant prices). In fact, depreciable wealth is generally estimated by the "perpetual inventory" method, whereby real net investment by type is cumulated over time, and then revalued to current prices. In current prices, changes in wealth reflect not only net investment but also price changes.

The Commerce Department defines investment narrowly to include only business capital formation, residential construction, and net foreign investment. This analysis defines tangible investment and the resulting wealth more broadly to include purchases of structures and equipment and inventory accumulation of all sectors—households and governments as well as business.

Combined balance sheet of the United States on December 31, 1978

Assets:	Billions	Assets:	Billions
Demand deposits and currency ¹ -----	\$296. 0	Structures-----	1, 042. 1
Time and savings ac- counts-----	703. 1	Equipment-----	2, 202. 1
Insurance and pension reserves-----	458. 1	Land-----	848. 4
Corporate equities-----	896. 7	Total-----	9, 922. 2
Government obligations--	612. 1	Liabilities and net worth:	
Corporate bonds-----	247. 4	Liabilities:	
Mortgages-----	429. 8	To U.S. residents ³ ..	4, 142. 9
Other credit instruments--	788. 8	To foreigners-----	163. 5
Security and trade credit	261. 6	Corporate equities-----	896. 7
Other ² -----	346. 0	Net worth (or net na- tional wealth)-----	4, 719. 1
U.S. foreign assets-----	213. 7	Total-----	9, 922. 2
Monetary gold-----	11. 7		
Inventories-----	\$564. 6		

¹ Includes Treasury currency and IMF position.

² Includes interbank claims, taxes payable, and miscellaneous.

³ The breakdown of this aggregate is the same as shown for domestic financial assets owned by U.S., residents, except for corporate equity shares, which are shown separately.

Sources: Tangible assets (net of depreciation reserves) are estimates of The Conference Board. The foreign assets, liabilities, and monetary gold estimates are from the U.S. Department of Commerce, *Survey of Current Business*, October 1975. The other estimates are derived from the Federal Reserve Board, *Introduction to Flow of Funds*, February 1975.

Mr. ALLEN. Do you have the totals there?

Mr. FIEDLER. I don't have any part of the study with me.

Mr. ALLEN. I suggest that you are going to find that the ratio of public and private debt to the value of the property in this country has increased and has had to increase every year under our financial type of system and that the only way that you can continue to function is by continuing to increase the debt, increase the amount of interest that is having to be paid and undertaking to meet those debts by deflating the value of the dollar through inflation.

Mr. NEAL. I am interested in Mr. Perry's suggestions on lowering the levels of unemployment. The other three members of our panel have already presented their views on this topic.

Mr. PERRY. I pretty much agreed with some of the very sensible comments that Mr. Fiedler was making. Here I guess the one thing I would add is that the main barrier to our reducing unemployment, not to zero, but to much lower levels than it is today is the fact that we have this ongoing inflation.

I think you can't separate the achievement of one goal from the achievement of the other. Therefore anything we can do to deal directly with the inflation would permit us to pursue higher employment levels at the same time.

Now the list of things that one could do to deal directly with the inflation problem and slow down this merry-go-round that we are on at the moment, which we inherited from the past, is not terribly long. It would be frankly experimental. There is a great deal of feeling against experimenting in this way.

I have in mind some new attempt to do a better incomes policy than we have had in the past. If we can get wages to rise more slowly and prices to rise more slowly, we will be freer to pursue our employment goals.

Right now we confront a problem. All of the things that anyone has mentioned to me that would expand employment substantially, reducing unemployment substantially, run the risk of perhaps worsening the inflation rate that we now have or at least not slowing to a rate that is acceptable to people.

I think we are in a position where the inflation rate is gradually slowing. If we are prepared to wait what may be a very long time, it will probably go away. But that is a very long time and it runs into the problem you raise and that we have not faced up to nearly as much as we should have in the last few years—what are we going to do about having this society provide all the job opportunities that people want?

Fundamentally that is the most important problem before us. I think it really gets—

Mr. ALLEN. It is the No. 1 priority.

Mr. NEAL. How specifically would you do it? Would you keep money growth at some level?

Mr. PERRY. I am not really concerned with money growth. If I could have an incomes policy—let me be hypothetical—have an incomes policy under which all the labor unions and large companies in the country agree they were going to trim 3 percent off the rate of increase of their wages and prices from what they were over the last 12 months, then I would feel much more comfortable and have no

inhibitions about pushing demand further to create more jobs and lower the unemployment rate.

That would involve more money growth than would a slower path for the economy. It would involve less money than the one we are contemplating now. To lower the spiral would mean you would not have to feed the system money just to stay even.

I would guess we could get by with less money growth if we could slow down inflation and at the same time get more real output. This is hypothetical. I don't know of any way of getting all these decision-makers together and getting them to agree to slow down the wage and price increase by 3 percent.

I do know those people are not looking at M_1 . When the rubber workers go out on strike, that is not what they are looking at. When their settlement comes in, that is not what determines their settlement. In a long run sense, if we keep this economy very slack, we will find that unions are settling for less and companies are shaving their margins.

That happens to be a long, painful process, and completely ignores what should be a very strong commitment to low unemployment and high employment opportunities.

Mr. NEAL. Would you pursue a more stimulative fiscal policy?

Mr. PERRY. If you grant me my hypothetical exercise, then we have options. We can pursue stimulative policies by undertaking goals that we might like in the public sector or by reducing taxes.

There is room to use some tax reductions to help reduce the inflation rate. I am speaking specifically of those taxes that get directly into the price level such as the sales taxes at the State and local level and the payroll taxes on employers that we now have.

Those are directly in the price level. When you talk about an ongoing wage-price spiral, anything you can do to buy yourself 2 points less inflation this year is going to have some permanent effect of lowering inflation in the future.

Those would be specifically fiscal policy moves and in the conventional sense that we measure it, they would be stimulative fiscal policy measures. But at the same time we might want to take some of this added room out in the form of a more expansionary monetary policy, pushing money growth more and encouraging investments.

You have a choice. If you got yourself the working room so you can raise output 3 percent more next year than you otherwise would have, you have a lot of leeway to do a lot of things. Some of them would involve fiscal steps. Some would involve more expansionary monetary policy. In other words, we have got 3 percent of output and can decide what to do with it—private sector consumption, public need, energy independence or whatever.

One does not lack for where to expand if we were prepared to give ourselves 3 percent more real output next year. The expansion could involve fiscal changes. It might very well involve more expansionary money policy.

Mr. NEAL. You have all commented—several of you commented on capital formation problems. Now how do they relate to monetary policy?

Mr. JORDAN. The greatest disincentive to long-term capital formation now to investors is not the fear that short-term money market interest rates are going to go up this year, but that we are going to

repeat these waves of inflation and high interest rates that are shown in your chart. They are concerned that there will be so much stimulus this year and next year that we will have to have very restrictive policies, in one form or another, in another couple of years, precipitating another recession, high unemployment, and that by the time any new investment that is undertaken now gets on stream producing a product, we will be in a recession and there won't be a market.

The greatest thing that could be done to encourage businessmen to engage in more long range planning, more investment expenditures to expand capital, and to plan for an increase in employment would be to insure them that we are going to have stability, continued growth like in the 1960's that is going to last for a few years.

I would like to comment on the possible use of incomes policy or wage and price controls. It is tempting to think that you can get some shortrun gain by, in a sense, shortening the lag to bring about a condition in the near term that would not otherwise occur for 2 or 3 years.

We have had more restrictive monetary policies in the past which was supposed to bring inflation down. We recently have had much more stimulative monetary policies trying to get output and employment up. The idea would be that through some proper use of wage and price controls you can achieve (this year, or at least next year) both full employment and stable prices that otherwise would not happen for a few years.

This is the kind of thinking that was going on in 1971. I admit that if there were ever ideal conditions for playing that game and using controls trying to get you there faster, 1971 was a good time to try it.

And they did. But the problem with controls is that their existence reduces the perseverance on the part of monetary authorities, and even fiscal authorities, in getting the trend of money down and getting the real fundamental inflationary force out because you have another weapon for dealing with inflation.

This frees up monetary policy to pursue full employment and full capacity goals. That is what happened in 1972. You had a tendency to resist market rate increase as interest rates were rising during the expansion. Money supply grew very, very rapidly, mainly because this other tool was dealing with the inflation problem.

Well, inevitably controls broke down, inflation erupted, and the price level went back to where it would have been anyway. The only way controls would work in theory was if you had appropriate money and fiscal policies, monetary growth being constrained.

Then, of course, the controls are not necessary. But the existence of the controls makes it less likely that you will get appropriate monetary policies (winding down the trend of money and the trend of inflation) for the kind of reason Mr. Perry cites. Then monetary policy is "free to be stimulative," to do these other things. I think that is a very dangerous approach to take.

Mr. MEISELMAN. In terms of your question about the relationship of monetary policy and inflation, there are several things about the inflation process that are clear to us, especially after the experience of the last few years.

When the inflation rate goes up, it is as if the inflation itself is an excise tax on business property because under the law, the profits of a business firm are calculated on the basis of historic costs. That

means that when profits are calculated, the profits are overstated because a business firm does not take the correct amount of depreciation in order to replace its capital used up in the production process.

The costs of replacing inventories are not adequately taken into account either, so it is as if the inflation per se is a form of an excise tax on business activity.

That by itself would reduce capital formation, both in fixed plant and equipment and in inventories. At the same time, the inflation throws people now into higher tax brackets, even when their real incomes are unchanged and are falling. My own effective tax rate has gone up very substantially because of the inflation, even though my real income has not increased. When people get thrown into higher marginal tax brackets, the incentive to save is changed, and people have less because the returns to saving fall. Instead people try to accumulate assets in a form that does not yield them any money income that is taxable.

In addition to high marginal tax brackets there is the fact there is no way to hedge against inflation, although we have talked about several mechanisms which result in some protection against inflation in the form of market adjustments involving higher interest rates.

These go only part of the way. There is no way that a person can typically get complete or sufficient protection.

The usual way that you accumulate assets is through saving and making funds available to business enterprises and the Government. But saving and investment are subject to differentially higher taxes. So one of the things that happens during inflation is that large numbers of people want to protect themselves and they tend to accumulate all kinds of other assets. Among them are durables, houses, gold, antiques, jewels, and so forth. You see this especially in countries that have a large amount of inflation over long periods of time.

We are starting to see similar events in the United States, with people buying all kinds of junk which they call "collectibles" because it is something tangible. That is really just a small indication of what would happen if we continue this process.

Both from the standpoint of saving and investment, even a steady rate of inflation produces these economic impacts. Steady inflation makes a country as a whole much less efficient. Stop and go policies make it even worse.

Under conditions of erratic inflation, people have less information about the current prices of many goods and of their market conditions. They also have less certainty about what the future will bring. Thus, you cannot make the kind of contemporaneous price comparisons that are necessary to know whether a pair of shoes at \$50 is such a good buy or that one you ought to run in and buy two pairs of shoes or whether the price is much higher than the prices of shoes available elsewhere.

At the same time, you cannot make efficient comparisons between today's cost of capital goods and what returns the capital will yield in the future. You cannot have efficient capital management. Inevitably there are more and more mistakes.

Inflation, especially variable inflation, makes the economy as a whole much less efficient. Those are some of the reasons that the kind of stop-go policy envisaged as necessary to offset an erratic private sector ends up being bad for jobs, bad for growth, bad for the economy as a whole.

After many, many years of it, we really ought to ask ourselves what we have to show for the last decade of inflation? We have a higher unemployment rate and much reduced economic growth. What had been a good situation with respect to growth in the private sector in the mid-1960's and even the growth of the public sector, has, in most respects fallen apart right under our feet.

Mr. PERRY. I am going to have to excuse myself, Mr. Chairman. I have an appointment at 2 o'clock at the other end of town. I am sorry.

Mr. NEAL. I am sorry to go on so long.

Thank you for coming. This has been fascinating and most helpful. Mr. Allen.

Mr. ALLEN. If a constitutional amendment or any other means should be provided that would prohibit any and every government from the Federal to the State to the local government from spending more than it collects in taxes, what would happen to this economy?

Mr. JORDAN. I think if it happened overnight, we would have a little bit of transition problem. But I think, ultimately, it not only can, but should be done. I think I would add an amendment, if I could propose one, that not only they can't spend more than they raise in taxes, but they can't spend more than a certain percent of personal income of that State—or the national income. At a minimum, this freezes the proportion of our economy that is government and maintains the proportion in the private sector. It would be desirable to have a gradual reduction in State, local and Federal spending as a percent of income so we can free resources to be employed in the private sector. That is where you get efficiency and improvement in people's standards of living.

Mr. FIEDLER. I share some of the goals, the long-term goals that were implicit and in some cases explicit in Mr. Jordan's answer, but I would give a completely different answer. The constitutional amendment of the sort you proposed—

Mr. ALLEN. However—

Mr. FIEDLER. I think that would be a disaster. There are many occasions when governments do need to increase their debt. There are many occasions when capital investment by the public sector is stimulative to the improvement of the standard of living of the American people.

I want that freedom to exist when it is appropriate to do so. I share the goal of less government as a percent of the total economy. I share the goal of more appropriate management of the public debt and the inflation and monetary policy and all the rest.

But I don't think we can achieve that by any strict prohibition on deficits.

Mr. ALLEN. Maybe I stated it wrong. Let's say that every single governmental agency in the United States from the local community, city, county, State, Federal government levels should decide tomorrow that we are going to live within our tax revenues collectible each year.

What would happen? Would it not precipitate a plunge, an economic plunge?

Mr. MEISELMAN. There would be problems with adjusting to that because we already have large deficits. In the area of fiscal policy as in monetary policy, I think it is wise that we change direction in a way that is not too abrupt.

But we have to keep our eye on the ball with respect to where we want to be. If the Federal Government is now running a deficit in the order of \$70 billion or \$80 billion per year, and you propose that the deficit be eliminated overnight, it is a question of how that is to be accomplished. If expenditures were reduced to eliminate the deficit, there would be some adjustment because there would be people who would temporarily be without jobs.

But the typical person who works for the Federal Government has more education and training and is relatively more mobile than the average worker. They would seem to be, on the average, among the most capable of finding alternative employment. It would be difficult for some of them just as it might be costly to me if I lost the major source of my income as a professor of economics.

In view of the fact that there is some implied commitment between an employer and employee that lasts beyond the week or two of the current pay period, the honorable thing to do would be to change gradually, but systematically.

However, I don't think that these considerations touch on an important problem. The important question that you bring up, which is crucial for much of current discussion of public policy reflects the fact that, on average, the goodies from expenditures come first and the costs come later.

Mr. ALLEN. I am not recommending any such thing as that.

Mr. MEISELMAN. No; but I think it is clear that there is an imbalance of incentives for those who vote the expenditures and vote the taxes. As you know, you are a hero in your district if you get some expenditures that are particularly favorable to them. At the same time the taxes to pay for the spending are highly diffuse. So, there is a bias in the procedures of the Congress as between expenditures and taxes.

The economic effects of going into debt which are also very diffuse. It takes a trained eye to see them. Many trained eyes claim they can't see them at all. Put it all together, it suggests that there is an inevitable bias toward more spending, more debt and larger government as well as a deferral of the diffuse costs.

These are some of the reasons that some people who are very concerned about the size of the public sector and who don't believe that people are getting their taxes worth—and I am one of them—have asserted that one way to help bring expenditures under control as well as have an efficient size of government—not to get rid of government but to have an efficient size of government—is to have a closer link between taxes and expenditures. You do the same thing in your own budget when you are effectively led to make a comparison between the cost of an item and the value you receive for it. That is essential for efficient choice. But, that element is missing in the way governments make choices because there are other ways to finance expenditures.

The other ways are print new money or incur vast debt. I live in the Commonwealth of Virginia and in Virginia, we have no public debt. For many years, people in other parts of the country used to

laugh at Virginia's pay-as-you-go policies. But I do not think they are laughing any more. I suspect that there are now many people in New York and the State of my birth, Massachusetts, that now think that Virginia was wise all along.

Mr. ALLEN. The real purpose of my question was to point out one thing and that is that we cannot consider monetary policy just within the sphere of how it may be influenced by the Fed.

But this is monetary policy, too, the operation of all of your various agencies of Government, whether or not they are undertaking to live within their budgets. Whether that is inflationary or deflationary.

I do not see how you can consider the whole question of monetary policy without taking that into account.

Mr. FIEDLER. Yes, sir. I agree.

Mr. NEAL. In your opinion, if I understand you all correctly, are you saying big Federal spending and big Federal deficits are not to be desired not because they are especially inflationary, but for other reasons?

Mr. FIEDLER. Yes, sir.

Mr. MEISELMAN. In terms of the inflationary impact, it depends primarily on how the deficit is financed. If the deficit is financed by "monetizing" the new debt, then it is inflationary.

If you have a larger government, it is inflationary to the extent that resources are generally taken from the private sector, where they are more efficiently used, and brought into the public sector where they are less efficiently used.

This means that a larger budget per se is inflationary. There would be even more inflation if it were financed by newly vested money.

Mr. NEAL. Can you put a number on that?

Mr. MEISELMAN. There is no way, except to evolve some assumption about the true value of government services, most of which have no market where prices and values can be recorded.

Mr. NEAL. Would you agree with our conclusion that the rate of money growth is responsible for approximately 60 percent of our inflation?

Mr. MEISELMAN. In that one episode when there was a sharp reduction in the supply of certain kinds of goods, that itself was an independent supply element in the inflation. I did make some ballpark estimates in testimony before this subcommittee 2 years ago about the inflationary impact of the devaluation of the dollar between 1971 and 1973.

I do not have the numbers offhand. But for a given stock of money, if the output goes down, the supply of money goes up. My calculations at that time which were very rough, were that the major factor in the inflation was the sharp increase that money had taken in 1972 and 1973 rather than the reduction in output.

Mr. NEAL. Let me thank you all for coming. I apologize for keeping you so long, but this session really has been quite informative.

Let me announce that Governor Partee of the Federal Reserve Board will testify tomorrow at 10 a.m.

The subcommittee will now be adjourned until tomorrow morning at 10 a.m., when we will continue our hearings in this same room.

[Whereupon, at 1:43 p.m., the hearing was adjourned until 10 a.m., Thursday, June 10, 1976.]

THE IMPACT OF THE FEDERAL RESERVE'S MONEY POLICIES ON THE ECONOMY

THURSDAY, JUNE 10, 1976

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON DOMESTIC MONETARY POLICY
OF THE COMMITTEE ON BANKING, CURRENCY AND HOUSING,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10:06 a.m., in room 2128, Rayburn House Office Building, Hon. Stephen L. Neal [chairman of the subcommittee], presiding.

Present: Representatives Neal, Hannaford, and Gradison.

Mr. NEAL. Let us go ahead, please. I am afraid we will have a quorum call before too long.

The hearing this morning on the impact of the Fed's money policies on the economy marks the third day of such hearings being held by this subcommittee. I am pleased to say that the six witnesses who have already testified before the subcommittee have greatly contributed to our attempts to get a handle on the responsible conduct of monetary policy, and its relationship to fiscal policy, inflation and unemployment.

While there is not one right answer that will solve our economic problems, testimony presented before the subcommittee has indicated past money policy deficiencies and errors and put forth constructive suggestions on restoring stable prices with continued recovery.

Just as we hope that these hearings will help to promote sound economic policies, we also hope that they will prove to be educational.

We are trying to ask questions about the importance of monetary policy as it relates to the whole economy, how well it has been administered in the past, and what, if anything, we might want to do to bring about a change in it for the future.

We are trying to be just as objective as we possibly can, trying to let the facts unfold as they are without prejudice. We really are making every effort to do that to the best of our ability.

We are pleased to receive as our witness today Governor Partee of the Federal Reserve Board. Governor Partee, I welcome you to our hearing.

Please proceed as you wish.

STATEMENT OF HON. J. CHARLES PARTEE, MEMBER, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

Governor PARTEE. Thank you, Mr. Chairman.

I am pleased to participate in these hearings on monetary policy and its effects on the economy. During the past year, aided by the

implementation of House Concurrent Resolution 133, a constructive dialogue has developed between the Federal Reserve and Congress on the course of monetary policy. I am hopeful that this morning's session, which I understand to be exploratory and educational in nature, will help further our mutual understanding of the issues involved. I would like to begin with some brief comments on the monetary policy process, based on my experience over the years working in this area, and then I shall be happy to respond to any questions the members of the subcommittee may have.

Although economists differ in their theoretical approaches to the channels through which monetary policy works, there is little or no disagreement in the profession that monetary conditions have a profound impact on the performance of the economy. One view is that monetary policy influences economic events primarily by changing the stock of liquidity—particularly, the supply of money and near-money substitutes—and thereby the willingness of consumers and businesses to spend and invest out of these more, or less, ample balances. Another view is that the influence of monetary policy stems mainly from its effects on the money and capital markets; by affecting the cost and availability of credit, policy actions will tend to encourage more, or less, consumption and investment based on the use of credit.

In fact, these theoretical approaches are not contradictory. They both find that an expansive monetary policy will tend to encourage more spending while a restrictive policy will tend to restrain it. But they do approach the process from different vantage points, and the quantitative measures they suggest we look to in monitoring the conduct of monetary policy differ sharply. The liquidity approach emphasizes the rates of growth in the various measures of the money supply— M_1 , M_2 , M_3 , and still broader definitions encompassing successively larger proportions of what might be considered to be the public's total stock of liquid financial assets. The credit approach to monetary policy, on the other hand, emphasizes changes in the flows of credit through banks, other financial institutions, and the securities markets, as well as changes in the terms—including interest rates—on which such credit is made available. This difference in measurement technique, I believe, gives rise to much of the confusion and disagreement in the evaluations of current monetary policy that one often encounters in the press and elsewhere.

The fact is that observed monetary measures, regardless of current policy intent, will always reflect also the interaction over time of monetary policy with underlying conditions in the economy. Output, employment, and prices are affected directly by powerful forces apart from monetary policy, such as governmental tax and spending policies, the attitudes and spending proclivities of businessmen and consumers, the wage increases being obtained by labor and the pricing policies of business firms, the availability of foodstuffs, energy supplies and essential industrial raw materials, and economic conditions and developing trends abroad. In these circumstances, whether interest rates are comparatively high or low, or whether the demand for credit is strong or weak, will depend on many factors other than the rate at which the Federal Reserve is providing reserves to the banking system—the basic policy instrument at its disposal. Indeed, even the observed pace of expansion in the various measures of money supply

may reflect short-run variations in the public's demand for such balances or longer-run changes in liquidity preference in response to technological innovations in financial management, the level and trend of interest rates, and present and prospective rates of inflation.

It is important also to recognize that the impact of changes in monetary policy on various aspects of the economy tend to be reflected with differing time lags. If financial conditions tighten, for example, the effects are likely to appear much more promptly in securities market values, and hence on such wealth-sensitive variables as consumer purchases of durable goods, than in business-fixed capital outlays, which require long lead times from planning to fruition. Similarly, the effects of a change in financial conditions will be more pronounced in markets that are heavily dependent on the use of credit—such as for housing and other large investments—than in markets where demand is financed mainly by current income flows, such as for consumer soft goods and services. Ultimately, of course, these areas of the economy too will be affected by induced changes in the income flows themselves.

There is one further timing aspect that requires especially careful evaluation in the formulation and conduct of monetary policy. As I have already noted, the economic influence of monetary conditions—whether measured in aggregate or financial market terms—will be to encourage either faster or slower expansion in spending, depending on whether such conditions are easing or tightening. But this effect on the nominal GNP does not distinguish between real activity and inflation. In my view, a shift in monetary policy can be expected to affect real activity, as demands for goods and labor tend to be augmented or restricted, before it reflects itself in the rate of inflation. This is because it ordinarily takes some time for business and labor to adjust wage and price policies to changing market conditions. The time lag involved, and the intensity of the inflationary effect, will depend on the initial state of the economy and the sensitivity of expectations. But the inflationary effects will sooner or later develop, and this argues strongly against a policy course that calls for large injections of liquidity into the economic system as a temporary panacea. In theory, it might be possible to withdraw the excess liquidity in time, before the inflationary forces begin importantly to work. But in practice this will likely be very difficult—if not impossible—to do.

The complexity of the relationship between monetary policy and the economy, and the need to move cautiously in modulating financial conditions as economic circumstances and investor and saver attitudes change, indicate clearly the importance of flexibility in the conduct of monetary policy. House Concurrent Resolution 133 fully recognizes this need. Under this resolution, the Board reports quarterly on economic and financial developments, and specifies the current expectations of the Federal Open Market Committee for the probable growth rate ranges in a variety of monetary aggregates, alternately before the House and Senate Banking Committees. This procedure is one that permits frequent reevaluation, and appropriate adjustments in current monetary policy aims to the economy's changing needs, which I believe to be a highly desirable attribute. Quarterly accounting for the stewardship of monetary policy also implicitly recognizes the difficulty of projecting economic developments very far into the future with any high degree of confidence—an assessment with which, on the basis of experience, I heartily concur.

In the congressional deliberations leading to the present wording of House Concurrent Resolution 133, and in further discussions since then, a recurring issue has been the question of whether monetary policy intentions should be specified in terms of interest rates as well as monetary aggregates. The resolution does of course require that the Board specify 12-month growth ranges for the various monetary aggregates, and it provides ample leeway for adjustment of such ranges as conditions change. In my view, this approach is far preferable to any attempt to specify interest rate objectives.

While it is theoretically possible to specify the course of monetary policy in terms of interest rate levels as well as the monetary aggregates, it must be recognized that interest rates are particularly exposed to the influence of many variables external to the scope of monetary policy, and that there is thus a large risk of specification error. The announcement of interest rate intentions or expectations could lead borrowers and lenders to believe that the Federal Reserve could—and in practice would—guarantee particular levels of interest rates. But the System does not have the power to do so, for interest rates are influenced not only by the interaction of demands for credit with the available supply of funds, but also by the strength of the economy and public's willingness to defer current consumption in order to save for the future. Interest rates are also importantly affected by the expectations of both borrowers and lenders about the rate of inflation.

If the Federal Reserve did nevertheless attempt to maintain selected interest rates at some predetermined level, the effort could well lead to inappropriate rates of growth in bank reserves and the money stock. If interest rates came under upward pressure because of rising demands for funds, for example, System efforts to prevent interest rate increases would inevitably generate more rapid monetary expansion, thereby feeding new inflationary pressures. If, on the other hand, interest rates came under downward pressure because of slackening business activity and declining demands for funds, System efforts to prevent the decline in rates would inevitably retard monetary growth rates and quite possibly exacerbate the recessionary problem.

Thus, any serious effort to specify monetary policy aims in terms of interest rate intentions or expectations could well prove inconsistent with stated objectives for growth rates in the monetary aggregates. Of course, the central bank might attempt to hold to the interest rate objectives, regardless of the performance of the monetary aggregates. But even in this extreme case the result would very likely be self-defeating, as lenders and borrowers moved to protect themselves against the prospect of accelerating inflation or deepening recession, foreshadowed by what might be very high or very low monetary growth rates. Needless to say, these effects would be quite perverse from the standpoint of economic stabilization.

In closing, I would like to stress that monetary policy alone cannot be expected to deal with all of the Nation's economic problems. Fiscal policy has a powerful influence on the course of economic activity, and outsized deficits can and do contribute to inflation. Monopolistic behavior with respect to the setting of wages or prices lies outside the scope of monetary policy, and strongly influences the character of the inflationary bias also. Restrictive trade practices, whether imposed by private power or government regulation, serve

to limit productivity and raise costs to the same end. It will require the efforts of all elements of our complex society if healthy economic growth is to be sustained, unemployment reduced to appropriately low levels, and inflation brought under control.

Mr. Chairman, at your request, I have tried to be brief in my treatment of a very complicated topic. It may be that I have raised more questions than I have answered. But I will be glad to respond to questions that subcommittee members have.

Mr. NEAL. I thank you for your very thoughtful statement and for coming this morning.

Let me draw your attention to this chart, if I may. We have mapped the yearly money supply changes, shown by the black line, from 1954 up to this year.

Governor PARTEE. That is the narrow money supply, I assume.

Mr. NEAL. That is right.

I would like to ask you a couple of questions about it.

From your knowledge, would you say that that is essentially accurate?

Would you have any questions about the chart itself?

Governor PARTEE. Well, it looks roughly right. I would have no way of knowing whether there would be inaccuracies. We do revise the figures. There has been a benchmark revision in recent weeks that affected 1975 and 1976 data, so there probably are small differences; but I do not think they are significant, sir.

Mr. NEAL. I think we have included the revisions that have been published in these figures.

In looking at that chart, what I see, of course, is a roller-coaster type of pattern. I have to ask the question, has that been beneficial to our economy?

Please respond to that. Would you say that that has been beneficial?

Governor PARTEE. Mr. Chairman, I do not think you can just look at a chart in the abstract and draw a conclusion from it.

There are two features of that chart that stand out to me and I am quite sure stand out to you. One is that there seems to be an upward trend in the rate of money growth over a period of time spanning many years. The second is that there is a good deal of volatility in the series; that is, shortrun sweeps up and down in the rate of growth. But it must be recognized that those changes reflect a host of circumstances that affect not only the economy, but the observed rates of increase in money supply.

In a recession, for example, the tendency is for the demand for money to decline sharply. Interest rates also decline sharply at that time, and often the tendency will get ahead of the Federal Reserve and there will be a period of slow growth in the money supply before the basis for increases in money growth is restored. In periods of boom, of high level activity, the demand for money will be very strong. There will be very strong upward pressures on interest rates. There will also be a great deal of anguish about the effect of tight credit on housing, on automobile dealers, on farmers, on small businesses, and at those times there is a tendency, because of the rate at which interest rates have increased, for the money supply to grow more rapidly. In that environment, the Federal Reserve would be trying to hold back the rate of growth, but nevertheless there can be a period

where money supply growth is more rapid. So that accounts, I think, for a large amount of the fluctuation that occurs—the shortrun fluctuation.

Now, so far as the upward trend is concerned—and I would note that it does appear from the chart that it has been interrupted over the last couple of years—I think what is reflected there is the fact that society has required, legitimately in my opinion, that economic activity be reasonably good and that employment be reasonably strong. We have had a growing labor force. We have had to have rising business activity. We have had to have rising opportunities for jobs. But, given the social structure that has provided large wage increases well in excess of productivity gains, and given the structure of business which has permitted these wage increases and other cost increases to be passed through in the form of higher prices, there has been an inflationary bias—I believe a growing inflationary bias—in the economy.

Had the money supply not grown in that kind of environment, the result in the first instance would have been reduced levels of economic activity, higher unemployment, and a good deal of difficulty with the economy. So, it is not that I am disagreeing with what the chart shows; I just wanted to explain the background.

Mr. NEAL. It was the volatile nature of the chart that particularly interested me.

Governor PARTEE. Yes. I addressed that in my first comments.

Mr. NEAL. You state that without an increase in the money supply during these years we could not have increased our gross national product and so on. There is no question about that. But could the Fed have kept the growth of money supply on a more even keel if it so desired?

Governor PARTEE. Yes. It could have been done; that is, in abstraction. What would then have been required would be a willingness to see larger interest rate changes than did occur; that is, during those periods when that line on the chart is going down—periods which tend to occur very late in the boom or very early in the recession—in order to prevent that line from going down, interest rates would have declined much more sharply than in fact they did. When the line goes up, as it did, for example, in 1967 and 1968, and again in the early seventies, it would have required much higher interest rates than in fact developed during that period in order to keep the line from moving that high.

It is a question of the tradeoff between the interest rate effects and the credit availability effects and what they do to the structure of the economy, and the desire to keep money growth relatively constant. That is our continuing problem.

Mr. NEAL. So, you would assume that the economy is much more tolerant of swings in the money supply than it is of interest rate changes?

Governor PARTEE. No; I cannot reach that judgment.

I would say that one has to take into account the effect of interest rate changes and credit availability changes on the economy and that one cannot have as his only objective a growth rate in the monetary aggregates that is stable over time, or moving in a stable manner

over time, because there are times when the interest rate movement required is something that society simply will not tolerate.

As I explained at the beginning, there are monetarists and there are nonmonetarists in the economic profession. I have never chosen up sides, and the Federal Reserve tends to blend the two points of view.

There were many other things going on. We have had different boards of governors and different Federal open market committees during the period to which the chart refers. We have had different administrations; we have had wars and nonwar periods; and all of those affect the environment with which we are dealing. The point is that one must deal in practical terms on a day-by-day basis with what is going on in the economy, and often the price—the shortrun price—of holding monetary growth stable is more than society will tolerate.

Mr. NEAL. You mentioned interest rates. Is there a demonstrable relationship between the level of interest rates and the level of increases in prices—the level of inflation?

Governor PARTEE. I think the causality runs from inflation to interest rates; that is, I do not think that high interest rates make a very material contribution to inflation. But a high rate of inflation over a sustained period, and the expectation that there will be future inflation, does affect interest rates simply because lenders are not willing to see the real value of their wealth decline, and therefore they want an interest rate that will compensate for inflation. Borrowers are willing to pay the rate because they feel that what they invest in with the proceeds is going to go up in value, too.

Mr. NEAL. If I understand the process—and I would like for you to respond to this—if you set targets for short-term interest rates, then you change the growth of the money supply; if you increase the growth of the money supply to keep interest rates down for the short term, you increase the likelihood of inflation, as I understand it.

Is that essentially right?

Governor PARTEE. Mr. Chairman, we prefer to say that when we restrict the growth of reserves, which is what we provide to the banking system, in an environment where demand is strong the result will be rising interest rates. We do not put interest rates up, but by holding down on the supply of reserves, the effect is to put interest rates up. If we do permit overly large sustained increases in the money supply, I have no doubt that that eventually leads to inflation with a lag, and that the inflation will in the end put interest rates higher.

Mr. NEAL. What is emerging here is fascinating to me. Our chart maps the increase in the yearly changes in the cost of living occurring 23 months after fluctuations in money supply— M_1 . A consistent relationship is shown here, indicating that the sharp growth or contraction in M_1 is reflected in the level of prices.

According to this exhibit the rate of growth of money supply has resulted in increased inflation.

Governor PARTEE. Mr. Chairman, I do not disagree with the thrust of that chart. I am sure that you will understand when I say that it is not an elaborate analytic chart. It is simply an arithmetic exercise. If one, say, were to have plotted the change in unit labor costs and compared them with the Consumer Price Index, you would find a high correlation also.

There are some possible statistical difficulties with the chart. But I think that it is true that a rate of increase in the money supply above a minimal rate that would be associated with real growth in the economy, given our limited capacity to increase output in real terms in the economy over the years will in time bring an inflation. In effect what is being measured here is the subsequent cost of the earlier decision to try to keep the economy going at a reasonable rate. There is a process being described here and you are measuring the cost side. I am very much in favor of your doing that because I think so often the inflationary consequences of an expansive monetary policy are lost sight of because of the lag effect; and I think it is very constructive to examine it. But I would point out that there is an entire process involved. If in looking at this chart, you tend to conclude that had the money supply not gone up we would not have had inflation—everything else would have been just the same and we would not have had the inflation—that is a wrong conclusion because in fact the economy would have been for a time—perhaps for a time beyond the willingness of the public to see it—the economy would have been much weaker in the process.

What would have to happen in order to reduce that rate of inflation 23 months hence is that wage increases, cost increases, price increases, and profit shares for companies would have had to be held down. That process is very difficult to deal with in our economy—that is, the tendency for costs to rise more than productivity in the economy.

Mr. NEAL. Let me repeat that we are not attributing 100 percent of our inflation level to the growth of money supply— M_1 . Our estimates show that about 60 percent of inflation can be traced to the growth of M_1 . We are fully aware of the consideration that must be given to the dramatic increase in oil and food prices, the aftermath of wage and price controls, large wage settlements, and a host of other factors. The astounding thing that is emerging, though, is the magnitude of the influence of Fed policy. We see that one component in all of this—the Fed's money policies—accounts for 60 percent of the rate of inflation.

Governor PARTEE. Mr. Chairman, I do not quite know how to go about explaining this. Let me try again.

I do not mean to say that monetary policy is not very important. I do not mean to say that Federal Reserve action does not have a lot to do with the rate of inflation in the economy in subsequent periods.

Mr. NEAL. Sixty percent.

Governor PARTEE. But I can add the contributions of other variables to come to more than 100 percent—by using various components more than 100 percent of the variation in the rate of inflation can be explained. If I take unit labor costs as an explanatory variable, I am sure I will get more than 60 percent out of that. If I take some kind of measure of world demand and availability of industrial supplies, I think I can get some percentage there.

My point is that one tends to measure things—one of which is the rise in the money supply—that have a lot of the same causes in them, and are associated with the economic situation of the time, and do contribute to later inflation. I do not disagree; but I would not say the 60 percent flows purely from the money supply to the rate of inflation.

You mentioned the Federal deficit. I think we must recognize that the Federal deficit's inflationary effect may well show up in monetary policy, in the monetary aggregates, because a large Federal deficit will, other things being equal, put substantial upward pressure on interest rates and it will tend to induce a faster rate of monetary expansion just in order to hold the system together. Therefore, a large Federal deficit may—not as a deliberate matter, and not because the Secretary of the Treasury says it must be so—it may give you a higher monetary growth rate, and then the monetary growth rate is later reflected in inflation.

What I am saying is you cannot just separate the sources of inflation into finite separate pieces.

Mr. NEAL. Let me ask this question if I might. You mentioned wage increases several times as being highly inflationary. Why were wage increases relatively moderate during the early sixties? What would explain that?

Governor PARTEE. That is a very interesting question. I have thought long and hard about how to reestablish those conditions. I think as a matter of fact that the economy is closer to doing so now than it has been for the whole decade that has gone by.

My view of the matter is that we had a period of very slow growth in the economy in the latter part of the fifties. We had a number of recessions—in 1953, 1954, and in 1957, 1958 and in 1960 and early 1961. It was a painful process—and I might say that monetary policy was very widely blamed for the poor performance of the economy in the latter half of the fifties. But, as a result of that process, expectations and aspirations did tend to fall back and expectations of inflation tended to moderate so that we found ourselves in the early sixties with moderate growth rates in wages, quite slow increases in consumer prices, good increases in profits based not on rising profit margins but on rising volume—a very decent situation. I think that is what we are trying to restore at this time.

Mr. NEAL. Also during this period you had a very moderate and steady monetary policy.

Governor PARTEE. But we could have that, you see, because the other parts of the economy were not performing badly.

I was on the Board's staff in the early sixties and I remember well—we would argue about this or that detail of the movement in interest rates, but in fact credit availability throughout the period was very good. Rates were not trending up. They moved up somewhat cyclically in the early sixties, but not a great deal. The economy was performing well. We had a set of conditions that did not call for a great deal of increase in the money supply, and were really quite suitable except that there was a degree of unutilized resources in the economy that was gradually being absorbed during that period. It is not unlike, as I say, the current situation.

Mr. NEAL. That is right. It is also interesting to note that when there is a rapid increase in the money supply, you have a corresponding increase in the level of prices, with about a 2-year lag.

Now, when you suddenly turn your supply of money off, we have recessions. Would you agree with that?

Governor PARTEE. I would agree that the two are associated. You are reading a cause-and-effect relationship into this that is stronger than I would like to agree to.

I think that when there is a boom in the economy, that is, when there are all kinds of demand increases and sizable wage settlements are being given, there exist conditions that tend to create both inflation and strong demand for a rapidly rising money stock. When there is a recession in the economy, there tends to be a decline in the demand for money, so that it is easier to have smaller money growth. In fact, there is the danger of too low a growth rate in the money supply during such periods. Also, during those periods the inflationary pressures tend to come off the economy.

There is an association here that is very strong. And if we have the will to hold monetary growth within reasonable ranges—and I do not mean at any fixed number, month by month, or even quarter by quarter, but within reasonable ranges—if we can have the will to do that I think we can reduce the instability in the economy. And we can gradually reduce the rate of inflation in the economy. But you must recognize that this runs the risk that business profits will be poor at times; that wage increases will be hard fought and hard to get. There will be long strikes such as we are now having in the rubber industry. There may be periods of unemployment, regionally or nationally, that are very offensive to the sense of social justice of the modern U.S. economy. These are the issues that we are always struggling with.

Mr. NEAL. As I understand it, though, you are saying that there is a very strong relationship. In other words, if we do moderate the growth of money supply, we could expect a lessening of the rate of inflation and also should not expect these recessions.

Governor PARTEE. If we could moderate the growth over a significant period of time, we should expect a lessening in the rate of inflation. But we might very well have during that period of time an economy that is not performing well from the standpoint of providing employment opportunities, from the standpoint of profits, that kind of thing.

Mr. NEAL. Well, why? We had that in the sixties.

Governor PARTEE. Yes; but the conditions resulted from an economy that previously had not performed up to many people's expectations. And you need to have the precondition of ample resource availability, I believe, in order to have the basis for sustainable, noninflationary expansion.

As I said in my statement—and I think it is a very important thing for you to keep in mind—the effect of greater or lesser monetary provision in the economy falls on the nominal GNP. And the break that occurs between prices and real activity is unfavorable in the first instance. That is to say, if you lower monetary growth rates you will have in the first instance an effect on real activity that is unfavorable. And only after a lag—and the lag may be short compared with what it used to be—only after a lag will you start to get the benefits of a lower rate of inflation. If you expand the rate of monetary growth, I think the initial effect will be stronger markets, more employment, better conditions, all of things that are extremely favorable. But you will, again with a lag—and the lag may be shorter than before—with a lag you will be setting the conditions for heightened inflation.

It is that conflict between short run and longer run effects that has always been extremely difficult for us to deal with in explaining ourselves to the public.

Mr. NEAL. I am sorry to take so much time. Let me make one more point and I will be happy to yield to the gentleman from Ohio.

You started to comment on the deficits. We also charted the Federal deficits, and we see far less significant relationship between the level of deficits and the rate of inflation or recession than between M_1 growth and inflation and recession. And in fact as you know, at this point we have the biggest deficits in our history and one of the lowest rates of inflation.

I had always assumed that there was a strong relationship between the level of Federal deficits and the rate of inflation, and I never understood it; so I find this quite interesting.

Would you agree with this sort of conclusion? What kind of comment would you have on that?

Governor PARTEE. If you will bear with me for a moment while I find the table, I think I can make a contribution to this. I really have two points to make. One I already alluded to, and I will come back to it.

The first point is that deficits tend to be high in times of recession when the economy is not providing the revenue that one would ordinarily expect it to provide. But in such times of recession, you also have a decline in private credit demand. In effect, a deficit or a large part of the rise in the deficit simply substitutes for what previously was a private credit flow. And the total credit flow, the total credit expansion in the economy is not much different than before.

The Federal Reserve keeps quite elaborate figures on credit market flows by major sectors which are called the flow of funds accounts. Realizing that this would probably be a question, I had my assistant put together a table that compares credit flows; that is, the rate of credit expansion relative to the GNP by year for the nonfinancial sectors of the economy. We exclude the financial sectors to remove double accounting. For example, the banks have debts but they also make credit available, and to include both sides would be double accounting.

Let me just give you four figures from that table. In relation to the total GNP, the U.S. Government deficit in 1973 amounted to seven-tenths of 1 percent. And in 1975, it amounted to 5.7 percent. That is, it was 5 percent of the GNP larger in 1975 than in 1973. But if you look at the total flow of funds in relation to the GNP in 1973, the relationship was 14.3 percent. That is, the total increase in credit amounted to 14.3 percent of the GNP, and in 1975, when you had this very large Government deficit, the total was 13.6 percent of GNP lower than it had been in 1973.

I would argue therefore that the kind of deficit that simply substitutes for private credit demand and reflects basically the inability of the economy to provide the revenues to the Government that might ordinarily be expected, is not inflationary, and it does not tend to raise interest rates. Indeed, that was the case in 1975, and again this year there has been no upward trend in interest rates even though the Government is borrowing a great deal of money.

Therefore, I think you ought to try another chart. While I have no analytic trust in the particular level of any full employment deficit

number, I do think the changes that it shows from one period to another are significant. And I think you ought to try a chart using the full employment deficit or something like a full employment deficit concept.

Mr. NEAL. Excuse me a second. Do you have the series?

Governor PARTEE. Well, we have a series. There are various high employment surplus or deficit series. We have one that we keep within the shop.

There are some hard decisions to be made in working up a series as to what constitutes full employment, and also what to do with rates of inflation which have a powerful effect on revenues and how you wash them out in the figures. But I can provide the numbers to Dr. Weintraub.

Mr. NEAL. I wish you would.

Governor PARTEE. The second point which is more fundamental is the one I made before—I have to be very careful in stating this because I do not mean to imply political pressure or anything else by this. It is that when the deficit is pressing very strongly on credit availability and causing tight credit conditions in the economy and sharply rising interest rates—and we have had some occasions when that has been true—because interest rates are rising so sharply, and because there is so much structural impact occurring from this, there is a tendency to let monetary growth go a little faster than would otherwise be the case. Therefore, to the extent that the Government deficit constrains, if you will, policymakers to do what they judge to be in the best interest of the economy—to have a somewhat faster monetary growth rate—why the inflation effect of the deficit is showing up indirectly through that money growth rate.

Mr. NEAL. But if I understand it correctly that is still a relatively minor influence.

Governor PARTEE. I do not think it is so minor.

Mr. NEAL. Well, you know, the Fed does not always react the way you are saying that the public would like it to react or the way the Congress might like it to react.

Governor PARTEE. No.

Mr. NEAL. Could you possibly try to quantify that effect?

Governor PARTEE. No, I cannot really quantify it.

Mr. NEAL. Well, let's try to get something that would help in the public debate. You know, if we go on in this country assuming that Federal spending and the Federal deficit are the major causes of inflation, and they are not, then, you know, we will be fighting straws in the wind.

Governor PARTEE. Mr. Chairman, I do not think it can be quantified because the difficulty is that it is just a part of the whole picture.

Mr. NEAL. What kind of part? A very minor part?

Governor PARTEE. At times it is a strong part. It was a very strong part in 1965 and 1966 and during the beginning of the Vietnam War. And at other times it is not an important part. It varies from time to time. It varies also depending on the political attitudes of Washington, and so forth, during the period.

But I do argue that it is a very real potential danger. Indeed, the fear that one could just print money in order to finance deficits is the reason why we have an independent Federal Reserve System.

It has happened in many countries in the world at different points in time, and it could happen here.

Now it has been proposed by some that we ought to be very careful to see that monetary policy decisions do not in any way affect the fiscal policy intent of the Congress. And usually that proposal is stated in terms of maintaining interest rates—having a target for interest rates that does not change. Thus if the Congress decides that it wants to have a very much larger deficit as a matter of public policy, that will not tighten up the private sector at all; well, if you do that it means that you may get a rapid monetary expansion and that you will have the inflationary effect of that policy. It is precisely undoing what the concept of independence is intended to guard against.

Mr. NEAL. Let me say that I certainly share that concern and that I could not agree with you more that by monetizing deficits we were just kidding ourselves and the inflation problem was made worse.

Governor PARTEE. Right.

Mr. NEAL. May we catch this vote and then we will be right back. I know that Congressman Gradison has some questions and Congressman Hannaford has just come. I am sure that he will want to talk with you. We will be back in just a few minutes.

Governor PARTEE. That is quite all right.

[A brief recess was taken.]

Mr. NEAL. Let's see, you were commenting about the full employment budget and you were going to supply us with your series on that. We do not have those figures. Are you suggesting that we would see a significantly different relationship between Government deficits and inflation by using your series?

Governor PARTEE. I am not sure, Mr. Chairman. That would be something I would want to test because from the standpoint of analysis one would think that there would be more impact using the full employment deficit. It is a part of the whole and it seems to me that it is the whole of credit demand, if you will, that is important. We can speak of the deficit either in terms of its spending effects or in terms of its financing effects, but it is the whole of credit demand that does determine the kinds of pressures that develop and, subsequently, the rate of inflation. The independent contribution of the Federal deficit is better stated, I think, in terms of full employment financing.

Mr. NEAL. Well we will get that. But, I would still like for you to comment on the accuracy of the relationship our exhibit shows between the deficit and the rates of inflation.

Governor PARTEE. The full employment numbers would look entirely different than those, entirely different.

For example—let me see if I can find it here—in calendar year 1975, the actual Federal deficit on a national income basis was almost \$75 billion.

Mr. NEAL. I am sorry, I did not hear that.

Governor PARTEE. The Federal deficit this last year on a national income basis—that is, the actual deficit but in national income terms—was \$75 billion, and the full employment deficit was \$10 billion. So, there is a \$65 billion difference. There was a shift from a surplus of \$18 billion in 1974 on our figures in the high employment

series to a deficit of \$10 billion in 1975, which is quite a sharp shift. I just do not know how the results would look. We have not done it.

Mr. NEAL. Well, let me return to this in a minute. Mr. Gradison has to leave, and so I would like to yield to him at this time.

Mr. GRADISON. Thank you, Mr. Chairman.

Mr. Chairman, first of all I want to recognize the fact that the subjects we are discussing today are not only important to us but there is a lot being written about them, and I would ask unanimous consent to include in the record at this point two recent articles.

One is from the June 7, 1976 issue of *Business Week* in their economic section under the title, "The Critics Ask: Is Monetarism Dead?" And, the second is from today's, June 10, 1976 *Washington Post*, an article by Hobart Rowen, under the title, "All That Worry About Fed Policy."

These both are related to what we are discussing and therefore I ask unanimous consent that they be included in the record.

Mr. NEAL. Without objection, so ordered.

Mr. GRADISON. Thank you, Mr. Chairman.

[The articles referred to by Mr. Gradison follow:]

[From *Business Week* magazine, June 7, 1976]

THE CRITICS ASK: IS MONETARISM DEAD?

Money alone sets all the world in motion—Publius Syrus, circa 42 B.C.

Monetarists who, like Publius, consider the money supply the prime mover in the economy, received a sharp jolt last week. The Commerce Dept. revised its estimate of the growth of the gross national product (adjusted for inflation) in the first quarter from an already high 7.5% to 8.5%. The monetarists had been hoping that the revision would be in the opposite direction—and for good reason. Although it has speeded up since (page 18), from the third quarter of 1975 through this year's first quarter the nation's money supply had grown at an anemic 2.5% annual rate. In the monetarists' view this could mean only one thing—the recovery would be slow and might even peter out. Instead, the continued strong growth of the economy despite meager money growth means to nonmonetarist William Nordhaus of Yale University that "the simplistic relationship that money determines national income has fallen apart."

The meaning.—If Nordhaus is right, then the impact of the monetarists on policy will be severely blunted. Since the late 1960s the monetarists have gained an important voice in Washington. Today the money supply numbers are watched by bankers, brokers, and bureaucrats alike. Even the Keynesians, the arch rivals of the monetarists, use the money supply in their forecasts. But if monetarism continues to prove a feeble guide to forecasting, it will cast doubt about the use of the money supply as a key policy objective in controlling both real output and inflation. The result may be a return to an emphasis on interest rates and fiscal measures as the best tools in the economic arsenal.

Furthermore, the Keynesians have been taking it on the chin since the late 1960s. The debate between them and the monetarists, after lying largely dormant since the Keynesians caved in, once again is very much alive.

Some Keynesians, to be sure, also missed the strong upsurge in the economy. However, as Nordhaus notes, "Keynesians look at money, interest rates, inventory levels, tax cuts, rebates and consumer savings, among other things." The monetarists "put all their bets on their money equation, and when that goes down the drain it means the whole ballgame."

MONETARISTS DEPENDED ON GROWTH IN MONEY SUPPLY AND MISSED THE RECOVERY

The fact that the equation linking money and national income has gone down the drain, at least temporarily, is undeniable. For example, on Mar. 8, Dudley D. Johnson, a monetarist economist at Citibank, presented his forecast for 1976 to the Shadow Open Market Committee, a group of monetarists who meet twice a year to advise the Federal Reserve. Based on his money model, Johnson projected

a first-quarter real GNP growth rate of .69%. The actual increase was 12 times as great. Clearly, the monetarists blew it, and the question is: was it a reflection of fundamental fault in theory or interesting aberration? The answer lies in the nature of the demand for money.

What went wrong.—The cornerstone of monetarist thinking is that the demand for holding money by companies and consumers alike is basically stable and depends critically on the level of national income. This means that if the amount of money increases then the public will find itself with excess cash and will therefore step up the level of spending until the balance between money holding and national income is once again struck.

Thomas Mayer, a monetarist economist at the University of California, now worries "whether there has been a shift in the demand for money." What Mayer means is that now a relatively smaller stock of money is supporting a relatively larger GNP. Monetarists have traditionally maintained that the velocity of circulation—the number of times money turns over relative to national income—does not change drastically from period to period. Therefore, once the stock of money is known, the level of GNP is foreordained. But if velocity is shifting and unpredictable, then there is little that a monetarist can say about where and at what speed the economy will be headed.

Allan H. Meltzer, a monetarist theorist at Carnegie-Mellon University, argues, however, that even if the demand for money has shifted, monetarists are in no real trouble if it is a one-time shift. "If, however," he says, "the demand for money keeps shifting, then all economists, not only monetarists, will have a tough time explaining what is happening in the economy." Meltzer believes that velocity, which has been increasing at more than three times its historical growth trend, will "very soon move back to trend."

Another monetarist, Jerry L. Jordan, economist for Pittsburgh National Bank, agrees with Meltzer. "Velocity should show only a 2% increase in the current quarter, down sharply from the more than 9% increase in velocity in the first quarter," says Jordan. And he estimates that, because of the 2.7% increase in money stock in the first three months of the year, real GNP should slow to less than half the 8.5% rate in the current quarter. "But if it's as strong this quarter, then I would rethink the linkage between the money supply as measured by M_1 and income," Jordan says.

Monetarists have often been chided for the difficulty they have in agreeing on a definition of the money supply. Such monetarists as Meltzer, Jordan, and Johnson insist on using M_1 , which includes currency and checking account balances. Milton Friedman, on the other hand, often uses M_2 , which adds time deposits at commercial banks. Indeed, the definitions of the money supply go as far as M_7 , which also includes mutual savings bank deposits, savings and loan and credit union shares, large CDs, short-term government securities, savings bonds, and short-term commercial paper.

Over the past year, M_2 growth has accelerated much more than the rate of M_1 . Those who, like Friedman, use M_2 in defining the money supply have a lot less to explain in the economic recovery. And Meltzer concedes that if "we continue to get these kinds of movements in M_2 relative to M_1 , I would reconsider which money aggregate is the most accurate indicator." Says Franco Modigliani, president of the American Economic Assn. and a leading critic of monetarism: "That's just the point. They don't tell us which M to choose, and when M_1 and M_2 diverge, they don't tell us what to do." Says James L. Pierce, economist on the House Banking Committee, "It seems to me, given the importance of money to the monetarists, that unless monetarism is some sort of religion, then they ought to be able to define money and stick with the definition."

THE LINK BETWEEN MONEY AND THE NATIONAL INCOME HAS GONE DOWN THE DRAIN

A mystery.—Aside from the difficulties in choosing the precise measure of the money supply, the monetarists' explanation of the channels through which money growth causes nominal GNP to increase remains shrouded in mystery. In the monetarist scenario an increase in the stock of money has spill-over effects on spending in every nook and cranny of the economy, from the purchase of printing presses to pretzels.

On one level, Friedman has compared the link between money and spending to a helicopter raining down money on people. Even Robert H. Rasche, a monetarist at the University of Michigan, finds that this makes little sense. He says: "In that case we are talking about an increase in consumer wealth, which of course affects spending. When it comes to the Fed's market operations it's another

story." When the Fed buys bonds the sellers end up with more money but with fewer bonds, so there is no material increase in wealth.

On a more sophisticated level, Friedman argues that the process operates through a ripple effect of changes in relative prices. When the Fed buys bonds in the open market, the price of bonds rises, and other assets like stocks become cheap relative to bonds. This stimulates the purchase of stocks and raises their prices, making other assets more attractive. The process continues down the line to all goods and services until the economy as a whole has adjusted its increased money to a new and higher level of income and prices.

To Mayer this transmission needs rethinking and testing. "It's not a fiction," he says, "however, I would like to see these steps laid out clearly in detail so that we could test and watch the process all along the way. So far the monetarists have not done this."

But to many Keynesians, the Friedmanian process is indeed a fiction—a black box. And their view of how monetary policy works differs sharply from the monetarists. They say the major impact of an increase in the money supply is on interest rates and the availability of credit. When the Fed buys bonds, interest rates fall because the price of bonds rises and the banks have more funds to lend when the bond sellers deposit their checks. The decline in rates and the infusion of reserves makes credit more available and cheaper, stimulating spending on capital investment and inventories.

As the Keynesians see it, the impact of increasing the money supply on prices depends critically on the level of utilization in the economy. Therefore, they argue, with unemployment at 7.5 percent and industry operating well below capacity, there is little danger of rekindling inflation, even if money growth accelerates.

Another split.—Here, too, the monetarists part company with the Keynesians. Because, according to them, an increase in the money supply signals that price increases are on the way, inflationary expectations quickly force interest rates up—especially but not exclusively on long-term bonds. Trying to lower interest rates by hyping the money supply is self-defeating, because rates will rise instead. Moreover, says Meltzer, "Given anticipations, the level of capacity utilization in the economy makes little difference. An increase in the money supply in the 1930s would have had the same impact on prices as a similar increase in the 1960s." Pierce finds Meltzer's position completely unacceptable. "It's mind-boggling," he says. "It defies all common sense."

The debate between the Keynesians and the monetarists may have been going on under other labels perhaps as far back as Publilius. And it may take that long to resolve the issues. But if the recovery in the next few quarters is robust, then the monetarists may suffer the same skepticism that befell the Keynesians in the late 1960s.

[From the Washington Post, June 10, 1976]

ALL THAT WORRY ABOUT FED POLICY

(By Hobart Rowen)

Until very recently, the Federal Reserve Board, under the skilled hand of Chairman Arthur F. Burns, had been enjoying something of a honeymoon. Interest rates and inflation were trailing off, and the economy and stock market were moving up together.

The economy continues to move forward at a moderate rate, and the inflation numbers are still the envy of the rest of the industrial world. But interest rates have started to edge up—and the stock market, ultrasensitive to money rates, has started down.

What Wall Street would like to know, of course, is just what Chairman Burns has in mind. Is he fearful that the recovery has already generated too much steam? Will he drive interest rates up even more, to ward off the threat of a resurgent inflation?

Worse, is he so sensitized to charges that in 1972 the Fed followed too easy a money policy, that he will now over-compensate, and—willy-nilly—pursue an austerity course in this campaign year?

Rep. Brock Adams (D-Wash.) recently articulated some of these fears by accusing Burns of tightening up money in small, almost imperceptible steps that he said were frustrating congressional policy.

"The Congress, through the medium of the Budget Resolution," Adams said in a speech to the House, "has provided Mr. Burns with a clear and unambiguous signal—don't drive up the interest rates; we need them kept low to maintain the recovery and prevent its disruption."

It is clear from the actions of the Federal Open Market Committee that Burns has clamped down on what he considers to be an excessive rate of growth of about 9 per cent in the money supply since February. Key short-term interest rates have risen about one full percentage point.

But there is reason to believe that the money and stock markets have read into Fed actions a willingness to take extreme steps to curb the growth of the economy that doesn't match the intentions of the canny chairman of the U.S. central bank.

Although the Ford administration, for political reasons, is making the current modest recovery sound like a boom, the Federal Reserve Board believes that the economic upturn so far is mild, fairly well-balanced, and not at all sharp. "It's just an average recovery," says one insider at the Fed.

The notion put forward by Treasury Secretary William E. Simon as an excuse for "Rambouillet II"—the summit meeting in Puerto Rico at the end of June—is that the recovery has accelerated beyond expectations, and that one must worry about latent inflationary consequences. This view is greeted with total skepticism at the Fed.

The recovery just about matches Burns' predictions. Moreover, given the amount of persistent excess capacity and high unemployment, the Fed doesn't think that the economy is getting out of hand.

I'm aware that this is not the conventional picture of the Fed one gets from market letters and some other partially informed sources on the Fed.

The fact is that much of the conventional wisdom and current criticism about the Fed has been floated by devotees of monetarist theory. They look only at one number—the growth of the money supply—to try to figure out what Arthur Burns is doing.

Yet, with only a small growth in the money supply in the last 9 or 10 months, the economy has moved up to a level that the monetarists failed to predict.

Chances are that Burns will try to squeeze back an excessive rate of money supply growth—more because of the public relations impact of these numbers than anything else. But that shouldn't be read on Wall Street as a sign that the Fed has plans to put the economy through a wringer. The Fed is very close to the view expressed by many liberal Democratic forecasters that the recovery has a long way to go.

To sum it up, the time hasn't come to worry about the rate of growth in the economy, if I read Fed policy correctly. That won't arrive until consumer credit starts exploding, plant capacity is stretched, and labor markets are tight. Until those conditions are present, and none of them is yet in sight, the financial community ought to put its worries about the Fed aside, and concentrate on more important issues, like the problems of the British pound, and the total absence of a federal energy policy.

Mr. GRADISON. Governor Partee, I recognize the significance of your statements about the reason that the Fed at times would perhaps like to see the interest rates somewhat higher in order to send a signal to the economy that the Fed is not going to sit idly by at a time that there might be a resurgence of inflationary pressures or inflationary expectations. We seem to be in a period like that now.

I am interested in the way in which this message is transmitted or the way in which it is interpreted. It appears that the message has been sent and it has been interpreted in such a way that there has been a substantial weakening in the securities market, certainly the equity market, as well as an increase in short-term interest rates.

Do you think that this reaction is overdone? Are you disturbed by the extent of change that has taken place in the equity values or interest rates during the last month, taking into account the relatively small changes in the Fed funds rates which have triggered these reactions?

Governor PARTEE. Mr. Gradison, I do not know that I would ever want to seek a particular interest rate level or a particular change in interest rates as a signal. It is a dangerous game to be involved in, and, I am not sure that I would want to characterize policy in that way.

I would say that in recent months, in February and March, there was a good increase in monetary growth rates, and then in April there was a very large increase in monetary growth, and if you put the period together, you get a rather high rate of expansion. In the case of the M_1 , for example, it is close to a 9-percent annual rate over the period, which is above the target ranges that we have given to the House Banking Committee and the Senate Banking Committee. And I would rather say that the increase in the Federal funds rates has occurred because we were trying to hold back somewhat in the provision of reserves as a reaction to this strength in the monetary aggregate.

Now the change in interest rates—market interest rates—has been rather substantial for the changes that have occurred in these monetary conditions. The funds rate is up only a little less than three-quarters of a percent, and yet the interest rate changes in the market have been quite substantial, in the long-term market as well as in the short-term market.

I think the main reason for this is the expectational influence; before, people were surprised that rates were as low as they were and that they were turning down, but they began operating on that basis. And, then when the rates turned, people tried to anticipate the future again and decided that rates would be still higher in the period to come, so they had better make their adjustments quickly. It seems to me that this anticipation of the future could very well be wrong. It has been wrong before. Or, the intensity of the movement that is expected in the market could be wrong, and so we very well might get a correction in those rate levels.

In the long-term market there is no real reason for rates to move upward. I think what we have had is a sympathetic reaction to the short-term rate movement. Given the demand for funds, which is substantial but not overwhelming in the long market, and given the reduction in the rate of inflation that has occurred, it seems to me that there is little reason for long rates to be higher. We could have just seen a sympathetic reaction that will now be corrected in that area.

I happened to read Bart Rowen's column this morning; I thought it was an interesting column, and I agreed with the thrust of it.

We at the Board do not like to prejudge what is going to happen to interest rates in the future and we do not like to prejudge them because we do not know what events will transpire. The market is prejudging, to a degree, interest rates in the future, and it may be as wrong as we can be if we try to do it.

Mr. GRADISON. My understanding of what you have just said is that you believe that the market may have overreacted.

Governor PARTEE. Yes, I think it may have. There is a rhythmic cyclical thing here that the market people are looking at. That is, when we have business recoveries and they become more vigorous as they extend over a period of time, one expects interest rates to go

higher simply because there is more tension in the credit markets and more credit demand.

I think it is that cyclically-oriented analysis that has led to the strong reaction, and it may or may not be right.

Mr. GRADISON. Governor Partee, the charts that we have had do not appear to take into account the factor of velocity.

Chairman Burns in his appearances before us has indicated that during a cyclical recovery it is not unusual for velocity to increase, indeed it has increased rather sizably, maybe even faster than might have been anticipated during this recent recovery. Do we not have to take velocity into account in interpreting these charts?

Governor PARTEE. Yes, I think so. Of course, the charts have to do with retrospective data and velocity would fall out arithmetically from the lines in those charts.

Indeed, velocity over the whole range of the year shown in that chart has been pretty predictable. It is only in the last six quarters or seven quarters that velocity has moved really quite a bit more than one would have anticipated. Let me give an example of that from recent experience. As a part of its research activity the Board maintains a quarterly econometric model, which was developed to show maximum monetary influence on the economy. As a part of that model one can forecast the relationship between interest rates, nominal GNP and the money supply.

In terms of forecasting accuracy, that model has roughly been on target. However, in the last six quarters, given the realized nominal GNP and given the level of interest rates, the model, as of the first quarter of this year, had made a cumulative error, overpredicting the money stock by \$20 billion. Now, that is almost 7 percent of the money stock.

That is a massive error as these things go. What really bothers people is not so much the cyclical movements in velocity which can be expected and understood, but the possibility that something more fundamental may be going on that may change the relationship between money and GNP.

It is a highly technical issue, but it shows the looseness in relationships that in fact exists.

Mr. GRADISON. I want to ask just one more question. Really, this gets back to the discussion which you had with the chairman. My understanding is that you were suggesting that the economy can have a direct effect on the money supply just as the money supply can have a direct effect on the economy and therefore, as we look at these charts, we had best recognize, when we think of cause and effect, that we cannot be necessarily sure which is the cause and which is the effect, that it may work both ways.

I am not trying to oversimplify it at all. I just want to make sure I understand you.

Governor PARTEE. I think I would agree with that completely.

In abstraction one might say we will not let the economy have an effect on the money supply, we will simply hold money supply growth to a predetermined rate. That is usually the basis for most of the academic approaches to this subject, and it is reasonable to say that.

But one has to recognize that if you do that there will be effects on the economy that can be quite substantial and quite adverse from the standpoint of political and current social and economic perception.

Therefore, I do believe that the money supply, if you will, is to a high degree, a captive of the economy.

Mr. GRADISON. I notice on page 2 you refer to differences in measurement technique between the monetarists and fiscalists, if that is the word. Did you really mean technique, measurement technique or did you just mean maybe they are putting greater emphasis on different factors, one on the measurements of monetary growth and one perhaps more on credit flows and changes of interest rates? I was not quite sure what you meant by measurement techniques.

Governor PARTEE. I do think there is a tendency to exaggerate the differences. At exactly the same point in time you can read in the paper that monetary policy is, let's say, stimulative because the monetary aggregates are growing rapidly; and then you can turn the page and read an article that says the monetary policy is restrictive because interest rates are rising. It happens all the time. Sometimes I believe the newspapers, you know, shift over from the one to the other argument so that monetary policy will always be shown as being wrong. At one time the amount of supply is not going up, or it is going up too fast; and at another time, the interest rates are not moving appropriately.

That is the variation in measurement technique to which I referred. What I really meant to say—and I am sorry, I do not think I captured it well at the very beginning of the statement—is that all these measurements are a part of one economic system. That is, there is a logical relationship between monetary aggregates, GNP interest rates and credit flows. It should be possible to take any one of those and then specify the rest. And so, the tendency is for the monetarists to take the money supply and specify the rest, and for those who are more credit market oriented, to take interest rates and specify the rest.

But, in practice, I have found that the error that you may make is a good deal more substantial when you try to specify interest rates than when you specify monetary aggregates.

The reason for that is not any superiority in the monetary aggregate technique, but simply that we have a lack of knowledge about how the economy works in all its relations. Having been through a period on the staff of the Board when we were looking principally at credit conditions and interest rates, and then through a period where we were looking more at monetary aggregates, I am inclined to say you may not always get the optimal result by looking at the aggregates but you tend to minimize the chance of major mistakes.

Mr. GRADISON. Thank you, Governor Partee, thank you, Mr. Chairman.

Mr. NEAL. Thank you. We have another vote but we will be right back if you would please stay with us.

Governor PARTEE. Certainly.

[A brief recess was taken.]

Mr. NEAL. Thank you for waiting for us, Governor, I would like to yield now to the gentleman from California, Mr. Hannaford.

Mr. HANNAFORD. I was not here for your testimony, and frankly I have not yet had time to read it either.

Let me just touch on some general questions. We were discussing yesterday during a discussion on the current full employment bill, the record of unemployment in some of the countries of Western Europe. This is not precisely related to our subject, but is their record not dramatically better than ours? The record of unemployment of something like to 1 to 2 percent, is that in your field of expertise?

Governor PARTEE. Well, I do not have particular knowledge about each of those unemployment statistics, Mr. Hannaford, but I would say that there are measurement differences in a good many countries that make direct comparisons difficult.

There are structural differences among economies also that sometimes hide unemployment. To give you some examples, in Japan the unemployment rate is always low. But that is because there is a movement of people back into the countryside—into agriculture—when the jobs are not there, so you do not get a rise in recorded unemployment. In the case of Germany, there is a lot of foreign labor. And that foreign labor is exported when the demand for labor is not there, so it does not show up in their unemployment rate. There are things like that.

It certainly was true earlier in the postwar period that the perceived unemployment rate was lower elsewhere. It is now not so much the case. England, for example, has over 5 percent. In most of the continental countries it ranges between 4 and 7 percent. The differential between the United States and other industrialized countries is much less marked than they were earlier in the postwar years.

Mr. HANNAFORD. I asked the question simply because you regard the money supply, the monetary policy as a central feature in that; and I was wondering if it was related to the differences in the way those countries and ours handle their money supplies?

Governor PARTEE. I do not think so, no.

Mr. HANNAFORD. You mentioned the unpredictability of velocity in the last 6 months or so. Is that perhaps because of mechanical changes in the greater use of credit cards and other instruments for larger transactions in industry, and so on?

Governor PARTEE. We think that is a factor. Credit cards; overdraft checking, which lets you keep a smaller balance, for if you write checks in excess of your balance there will just be an automatic credit; the development of NOW accounts in quite a number of States; the bill-paying service that is done now through savings accounts at savings and loans and banks, all are factors. I have to tell you that we have spent a great deal of time and effort—or our staff has—on this question. And we do not have a fully satisfactory explanation for what is going on.

My own view—and I do not have the advantage of strong, analytic backup for it—but my own view is that what has happened has in part been a change in attitude in the economy—toward a more expansive, optimistic frame of mind after a long period of depression in 1973 and 1974. That has meant that we get more spending relative to the money stock measure; people have been more willing to spend; and they are less conservative than they have been in the past. I believe that people are much more optimistic and much more comfortable about the future than they were when we were having double

digit inflation, rising unemployment, political difficulties in Washington, all of those kinds of things that affected attitudes.

Mr. HANNAFORD. I see, a combination there of the mechanics, plus the optimism.

Governor PARTEE. Yes.

Mr. HANNAFORD. If you could remove the politics from it, do you think it would be desirable to have monetary policy and fiscal policy being made by the same hand?

Governor PARTEE. That is a very important qualification.

Mr. HANNAFORD. Yes it is, is it not, almost an absurd qualification?

Governor PARTEE. I do not think I would favor it. Now let me tell you why.

There is no reason, in principle, that good analysts could not manage both fiscal policy and monetary policy in the best interest of the economic health of the country. But I am afraid there would come times when, even as analysts, people would want to have a monetary policy that would confirm what they had done in the fiscal end or a fiscal policy that would confirm what was done in the monetary end. And I think there would be a slippage—a slopover of attitude between the one field and the other which eventually could get us into difficulty.

It often is asked, Mr. Hannaford, what is wrong with having the Secretary of the Treasury determine monetary policy? After all, it is a financial activity and the Secretary or the Minister of Finance is the chief financial executive of a country's government. Why not have him do it? Well, he might ordinarily do it very well. But there might come the day when, in order to succeed in his latest bond issue or in order to keep the budget down by having lower interest rates, he would decide to take a monetary policy action that was not truly in the interest of the country. I think we have something of the same sort of problem here.

Mr. HANNAFORD. Our testimony has indicated the general feeling that there is too much fussing done with monetary policy and short-term adjustments, and that we are something like the overly protective parent that suffocates the child; that, if we could take monetary policy and set money growth at a constant rate that would allow for the real growth in GNP. And maybe everyone would step back and let it go. Do you think we do a bit too much of that fits-and-starts kind of adjustment?

After all, the main problem with inflation is its unpredictability. If we could predict inflation at a given rate of 3, 4, or 5 percent and knew what it was going to do and could read everything into it, then a lot of the inequities could be read out of it.

Governor PARTEE. Well, Mr. Hannaford, I have never been a believer in a rule calling for a constant rate of growth in the money supply because I have been too concerned that it would not take into account structural changes in the economy, which would require different rates of input. A rule would give up entirely any counter-cyclical influence that monetary policy could contribute in dealing with holding back the economy when it was booming, or bringing it back up when it was in recession. It also would run the risk of changes of a kind that I was just talking about in the relationship of the observed measures, money supply and GNP. If people should come to perceive the money supply differently, and you do not realize it,

one would be running on the wrong rule. So I have always felt that there should be more flexibility than a constant rule would impose.

I have two more comments on this subject. I would have to say in retrospect that there has been more variation in the rate of monetary growth over the postwar period than I think would have been desirable. That is, as I look back, if I could do it over and I were the dictator, I would do it a little differently. There would be more stability than the chart that has been before us through these 3 days of hearings has demonstrated. I would rather have a little more stability than that shows.

My final comment is that I think the reasons for these variations in money supply growth, and the tolerance of the variations of the money supply growth, are to be found principally in the behavior of the economy and the behavior of interest rates. There are times when the economy requires a more expansive growth in the money supply because it is doing very poorly and every pressure there is on the Federal Reserve to follow a more expansionary policy. There are also times when interest rates are rising sharply, the distribution of funds among various sectors of the economy—housing, consumers, businesses, and Government—is changing and hurting various parts of the economy. When that rapid increase in interest rates is so antagonistic to what people perceive as their shortrun interest, there often is some tolerance for a higher monetary growth rate—simply in order to not have the rates go all the way up.

The very peak in short-term rates during the postwar period was in the summer of 1974, when the prime rate at banks was 12 percent. That was regarded as an extraordinarily high rate; and I think it was an extraordinarily high rate for business, borrowers and consumer borrowers to deal with. But the more stability you induce in the monetary growth rate, the more likely it is that you will have wide fluctuations of that kind in interest rates. I think most people perceive them as being adverse to their interests.

Mr. HANNAFORD. Yes. Is this increase in velocity that has been rather dramatic more recently—that no doubt is one of the factors of the more restraining monetary policy of recent months. I suppose it would be.

Governor PARTEE. Do you mean in terms of monetary growth rate?

Mr. HANNAFORD. Yes.

Governor PARTEE. Yes. We constantly analyze what is going on in the economy, the fact that the economy was doing well, that the indicators were good, that our projections of the future were quite satisfactory in terms of real growth, and that all of this was being accomplished with stable to declining interest rates and a lower rate of monetary growth, made us tolerant of that lower rate of monetary growth.

If the outlook had been different, if problems had been developing, or had interest rates been behaving differently, we might have wanted to step up the monetary growth rate. But in these circumstances, it seemed appropriate.

Mr. HANNAFORD. One last question. I am very sorry I missed your statement. Would you just give me a little primer on how the economy influences the money supply, this relationship of the one influencing the other?

I understand the money supply on the economy, but how does the change in the economy cause a change in the growth of the money supply? It should be obvious, I suppose.

Governor PARTEE. Well, it is a very complicated subject. Let me give you two illustrations of it.

One is that the increase in the GNP, the nominal dollar GNP, tends to bring with it a need for an increase in money in order to service, if you will, the expanding volume of transactions that occur in the economy. Thus, if economic activity is rising rapidly, the nominal GNP is going up rapidly, one would expect the demand for money to be quite strong simply because the economy itself was expanding. And therefore, other things equal, the result would be an accelerated increase in the money supply in a time like that.

The accelerated growth can be stopped over time—not immediately, but over time—by holding back in the provision of reserves that are required to support that money supply. But that brings a rise in interest rates. And so interest rates, at a time like that, would rise pretty sharply if the Federal Reserve were following a constant money supply target.

Let me give you an even more basic example. The nominal GNP is a function of costs and prices and real volume. Costs are things like wage rate increases that unions and employees negotiate; the cost of raw materials which is affected by supplies like foodstuffs; international demand for goods. There may well be a situation in the country in which there is a tendency to produce rather large increases in costs, for example, wage costs far exceeding productivity gains. In that case, that part of the increase in nominal GNP is, in the short run, rather fixed.

If, let's say, that produces an inflation of 6 or 7 percent, which it has in the past year, and we want to have real growth in the economy sufficient to reduce unemployment, say 6 or 7 percent, then we must have a nominal GNP as a matter of arithmetic that rises by 12 to 14 percent. It may be that in order to get that nominal GNP, there needs to be an increase in the money supply in excess of a predetermined normal amount.

Many economists say—and I would tend to agree—that if there were no inflation in the economy, one would want to have an increase in money supply somewhat slower than the growth in real capacity to produce, which is about 4 percent. We would want perhaps a 2- or 3-percent increase in the money supply. But as a practical matter, in order to keep the economy going, given the wage deals that are being made and the cost pressures that exist, you may have to settle for a larger increase in the money supply.

That is why I say that the economy affects the money supply.

Mr. HANNAFORD. You say that the money supply should expand slightly slower than the nominal GNP.

Governor PARTEE. Yes. There is a trend increase in velocity. It is not clear exactly what it is, but it is about 1 or 2 percent.

Mr. HANNAFORD. A trend of increase in velocity would cause you to adjust the money supply increase?

Governor PARTEE. So if we have zero inflation and are operating at a satisfactory level of unemployment, the increase in population, labor force, and productivity would give us the latitude for about a

4-percent increase in real output each year. We would normally expect a somewhat smaller increase in the money supply that would be consistent with that steady state condition.

Mr. HANNAFORD. Now, if you thought that the economy was behaving independently of your action in an inflationary way, that is, wage demands were too great or what have you, you would try to restrain them. Fed policy would try to restrain them with tightening up of monetary policy. Is that right?

Governor PARTEE. In a general way, Mr. Hannaford. Strong actions at a time like that are likely to topple the economy. Monetary policy gently exerts pressure on the system to try to moderate it over time.

Mr. HANNAFORD. The problem that I have—and we have discussed this with your chairman—is that there are some things that would respond to that, perhaps wage rates or some such, and there are other things which more recently do not appear to respond to it, such as costs of fuel and food.

Governor PARTEE. Yes.

Mr. HANNAFORD. It is hard to say how we can allow or have a monetary policy that restrains those things that will yield and subject themselves to such restraint and not turn back the whole economy.

It seems that we are punishing two different subjects. And one of them is innocent and the other one needs the punishment. Is that accurate?

Governor PARTEE. Well, it is a little harsh. But the fact of the matter is that monetary policy is an aggregate policy. It affects the economy as a whole. You cannot direct it toward one thing or another thing because it falls like rain on everyone. And so there is something to what you are saying.

Analytically, you might say that if there is a source of inflation that is external to the operation of the economy—let's say crop failure, or a quadrupling in oil prices by the OPEC countries—that you could make provision for that by having a little faster increase in the money supply than you otherwise would think was appropriate. That is a sound position, I think, simply because otherwise there would be a shortage of funds relative to the higher prices and the level of real demands needed to keep the economy employed.

It is an extremely treacherous operation, though, for if more money is provided and continues to be provided, we will start to validate the inflation that will be spiraling, that will be accumulating from those initial external forces. That is, if food prices go up the next thing is that wage increases need to be larger in order to keep people's incomes in real terms moving ahead. If people had their way, they would like to have growing real incomes. If you also validate that wage increase by having more money expansion, then you are on the way to an increase in inflationary forces. So it is a very delicate business.

But in principle, where there is an external source, an identifiable, clear, external source of price pressure, there can be a compensation made for it.

Mr. HANNAFORD. The dollars being released by your policy do not know what they are being released for and they do not know to run over and buy oil with it instead of paying higher wages.

Governor PARTEE. No.

Mr. HANNAFORD. Governor, I appreciate your responses and your patience for my not having been with you earlier. Thank you very much, Mr. Chairman.

Mr. NEAL. Thank you, Mr. Hannaford.

I am curious about another subject. What precisely did the Fed and the Treasury do the other day, do to help Great Britain? Did they buy pounds? Was it a purchase of pounds?

Governor PARTEE. No, sir. There is a standing set of agreements between central banks called the swap network, that in effect provides a line of credit among central banks for borrowing currencies as they need to do so.

So far as the Federal Reserve was concerned, what happened was that we activated \$1 billion of that \$3 billion line of credit that the Bank of England had with us, and the Treasury also provided another \$1 billion line of credit, and other countries provided another \$3.3 billion line of credit.

In fact, that money has not been borrowed, but it is a tap. That is to say, if England comes to need the funds, the funds will be there to the extent of \$5.3 billion. There is an obligation, on the part of England to repay it with interest, of course, and to repay it in dollar terms so that there is no foreign exchange risk for the United States.

What I would say has happened is that the English, in an effort to defend their currency and get their house in order, have arranged for a line of credit.

Mr. NEAL. Is that qualitatively different than the Federal Government's relationship with New York?

Governor PARTEE. The difference is that it is a short-term borrowing and there is a firmer basis for repayment by the English; namely, the English can get funds from the International Monetary Fund by agreeing to their terms and conditions, I presume, and therefore the potential creditors involved in this arrangement can be taken out.

In the case of New York there just was not any near-term prospect of repayment short of substantial changes in the fiscal management of the city of New York. Now, those changes are in process. It still is not a short term prospect of repayment, but there is now, I would say, some prospect for repayment.

Mr. NEAL. Is there some requirement for Great Britain to do things differently than it has been doing as a part of this?

Governor PARTEE. It has been working hard, I am sure. As you know the British have had an incomes policy for a year. They are going into a second year of incomes policy and are attempting to obtain an agreement that would hold wage-rate increases to about 4.5 percent. They have had some success with the unions; in England, labor is very highly organized, so that is very important. It so happens that this week the coal miners voted for it and the coal miners are one of the more militant groups calling for large wage increases. So there is, at least in terms of the management of the wage deal, quite an effort going on to reduce the rate of inflation in England, and to improve their circumstances.

There is also, I think, a general recognition of the need to reduce national governmental expenditure or at least the proportion of national government expenditure relative to the total outlays in the

country. There is not so much occurring in the short run on this issue, but I think there is a recognition that the governmental role needs to be moderated.

So, there are a number of constructive developments occurring in the British situation, I believe.

Mr. NEAL. The comparison between the public responses to the fiscal problems of New York City and Great Britain seems very interesting. Although Great Britain's fiscal dilemma was fairly well publicized, there was no particularly political outcry similar to the one we had when New York City asked for help.

Governor PARTEE. I dare say there would be if we do not get the money back.

Mr. NEAL. I would imagine there would be. I think then the American public would be wondering why Congress was not on its toes, do you not think, at that time?

Governor PARTEE. I was not directly involved, in any way with this, Mr. Chairman.

Mr. NEAL. I was not either.

[General laughter.]

Mr. NEAL. Let me ask you one other question. I have never understood why the Fed concentrates on the Federal funds rate instead of on reserves or some other element. Could you help me understand that better?

Governor PARTEE. Well, Mr. Chairman—are you talking about an interest rate as against an aggregate?

Mr. NEAL. Exactly.

Governor PARTEE. I would not say that we concentrate on the funds rate as against the reserves. The members of the Federal Open Market Committee have objectives in terms of rates of growth in the various monetary aggregates. There are, for operational reasons, month objectives as well as the year-long objectives which are given to the Congress, and we try to see, within our ability, that the reserves that are provided are appropriate to those objectives.

There are times, though, when there can be a change in the demand for money—perhaps quite temporary—where, in order to hold to the reserve target, there would have to be tremendous upward or downward pressure on interest rates, reflected in the first instance in the Federal funds rate. And because we feel that sharp gyrations in interest rates would not be constructive to the performance of the economy, in the short run we constrain our efforts to achieve the monetary aggregates by having limits on how far the Federal funds rate can move in a short period of time. It is not true that we are looking only at the funds rate. But the rate is, operationally speaking, a constraint on how far, without looking again at the whole situation at the committee level, how far the manger of the System Open Market Account can move in terms of rate effect to get the aggregates that we are after.

It is an old, long-established system in the management of reserve provision, and there are a lot of reasons behind it. But, I would say the main one is that we are concerned that sharp gyrations in interest rates would be upsetting to financial decisionmaking, and thus, counterproductive from the economy's point of view.

Mr. NEAL. But you are making a judgment, are you not, that those sharp turns in interest rates would be more upsetting than sharp turns in the money supply, and we might try to look into that.

Governor PARTEE. We have.

Mr. NEAL. Is that a demonstrable fact?

Governor PARTEE. We think it is. We have done elaborate economic and analytic studies of the economy, and we have concluded that the short run variations in money supply growth, or of growth in any of the aggregates, have very little impact on the performance of the economy so long as they are offset later on. Technically speaking, what we have found is that a two-quarter variance in money supply growth from a normalized rate does not affect the economy if it is offset in the subsequent two quarters. That is pretty well researched.

We feel, as I say, that interest rate gyrations are unfavorable. Now, I want to be absolutely clear about this. These are simply instructions to the system account manager. Every 4 or 5 weeks the Federal Open Market Committee meets and it considers what has gone on in the interval between meetings. And if, in fact, we are not getting the monetary aggregates that have been specified, even though the funds rate has been run all the way to the limit that was given to the manager, then it is open season for the committee to say, "Well, we are going to have to raise that funds rate range for the manager in the period ahead," or perhaps, "We think it would be so unfavorable in the present circumstance for that to be done that we are going to tolerate, for a period, the somewhat higher growth in the aggregates."

I am describing a decisionmaking process in which all of the people are brought together, physically, to discuss this all day long every 4 or 5 weeks, during which the instruction for the manager is framed; and any or all of these specifications may be changed.

I think it is a reasonable way of running the system. Monetarists often say that we should simply supply the reserves to the banking system and let the interest rates go where they will. But our view is that it is a short-run day-to-day operating matter; that there are a lot of difficulties with the monetarist approach operationally; and that it would cause variations in interest rates that would be so large that it would be very difficult for people to adjust to them.

That is the explanation, sir.

Mr. NEAL. You would anticipate a wide fluctuation in interest rates during a year's period?

Governor PARTEE. It should not be all that much different during a year. But I am really talking about day-to-day and week-to-week movements, because we are presently speaking of operations.

Just as a hypothetical example, if the Federal Open Market Committee wanted a narrow money supply increase in a range between 4.5 and 7 percent, which is the one that is currently stated, and if nothing happened to make them change their mind on that—such as a change in the money demand function or a change in the definitions or a change in the behavior of the economy—there is no reason, using the operational technique that I have described, why we would not get an increase in the narrow money supply within that range by permitting, over a time, interest rates to change consistent with that money growth objective.

Tolerating some variation in money supply simply smoothes the change in interest rates. But in fact, if there is no change in the view of the committee, I would guess that the interest rates at the end of the year would be about the same under either circumstance.

Mr. NEAL. One further question. Do you operate substantially differently than do other central banks throughout the world?

First of all I would like some source on information on how other central banks operate.

Governor PARTEE. I will have to talk to Dr. Weintraub about a source. It is a pretty complicated question.

I have some knowledge of this although I have not been active in the international field. I would say that we have a closer control, market-oriented control, over the system than any other country that I know of in terms of our open-market operations. We also have a system of reserve requirements against member banks—unfortunately not all banks, but only those banks that are members of the Federal Reserve System—that many countries do not have.

I would say that in recent years we have paid comparatively more attention to growth rates in the various monetary measures as an intermediate aim of policy. Of course, in the end, the aim of policy is always a good economic performance. But we have paid more attention to the aggregate than has been generally true around the world.

In general, central banks can be divided into two groups: Those who operate by providing reserves and taking out reserves or liquidity through open market operations; and those who do it by making loans to the banks or by taking out the loans. We are in that former group. Many other countries are in the latter group.

I think we can probably get you some reference on foreign central bank operations so you could read about the subject.

Mr. NEAL. I really appreciate that very much.

[The information referred to by Governor Partee follows:]

BOARD OF GOVERNORS,
OF THE FEDERAL RESERVE SYSTEM,
Washington, D.C., June 22, 1976.

HON. STEPHEN L. NEAL, *Chairman,*
Subcommittee on Domestic Monetary Policy of the Committee on Banking, Currency and Housing, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: At the recent hearings on Federal Reserve policy and the economy, you requested that I supply some reading references on central bank operations and the conduct of monetary policy in other countries. I asked the staff to look into the matter, and they recommend the following:

(1) Federal Reserve Bank of Boston. *Monetary Policy in Twelve Industrial Countries*. Boston: Federal Reserve Bank of Boston, 1973.

(2) U.S. Congress. Joint Economic Committee. *Comparative Features of Central Banks in Selected Foreign Countries*, prepared for the Joint Economic Committee by the staff of the Board of Governors of the Federal Reserve System. Joint Committee Print, Paper No. 1. Washington, D.C.: Government Printing Office, 1963.

The first reference, a copy of which I am enclosing, provides a relatively non-technical discussion of the institutions and instruments of monetary policy in Austria, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom. It also provides a short bibliography on each country. The second reference is admittedly dated but, we believe, still largely accurate. The publication contains information on ownership selection of boards, disposition of profits, relation to Finance Ministries, and roles in Government finance of the central banks of Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, and the United Kingdom.

In addition, you asked that we supply figures on the high employment Federal Budget surplus or deficit. Quarterly data for the period 1952 through 1975 are enclosed. I have taken the liberty of providing data from the Council of Economic Advisors instead of our own Federal Reserve figures because our quarterly data does not begin until 1964 and therefore would not be suitable to the requirements of the Committee's staff. In any event, the CEA series is not very different from our own.

I would be happy to respond to any questions about the material.

Yours truly,

J. CHARLES PARTEE.

[NOTE.—The 587-page document *Monetary Policy in Twelve Industrial Countries* (Reference (1)), is not included in the hearing record.]

COUNCIL OF ECONOMIC ADVISERS

High employment budget^{1 3}

(Surplus (+), Deficit (-), \$ billions, S.A.A.R.)

1952:		1963:	
I.....	-1.0	I.....	10.6
II.....	-3.8	II.....	11.9
III.....	-7.6	III.....	10.4
IV.....	5.6	IV.....	9.1
1953:		1964:	
I.....	-7.5	I.....	4.4
II.....	-9.1	II.....	-2
III.....	-7.4	III.....	3.7
IV.....	-8.3	IV.....	5.7
1954:		1965:	
I.....	-6.9	I.....	8.7
II.....	-2.6	II.....	7.2
III.....	-1.4	III.....	-6
IV.....	.1	IV.....	-3.5
1955:		1966:	
I.....	1.7	I.....	-6
II.....	4.3	II.....	.7
III.....	8.6	III.....	-3.5
IV.....	4.5	IV.....	-4.7
1956:		1967:	
I.....	6.2	I.....	-9.4
II.....	5.4	II.....	-9.3
III.....	7.1	III.....	-9.9
IV.....	7.1	IV.....	-10.0
1957:		1968:	
I.....	6.0	I.....	-7.1
II.....	5.5	II.....	-9.9
III.....	7.2	III.....	-1
IV.....	6.7	IV.....	3.7
1958:		1969:	
I.....	5.7	I.....	10.1
II.....	2.3	II.....	12.6
III.....	-4	III.....	10.7
IV.....	-1.8	IV.....	11.0
1959:		1970:	
I.....	3.7	I.....	11.2
II.....	5.9	II.....	3.5
III.....	6.3	III.....	3.6
IV.....	7.2	IV.....	5.9
1960:		1971:	
I.....	14.9	I.....	3.4
II.....	13.6	II.....	-1.6
III.....	13.2	III.....	-7
IV.....	13.4	IV.....	.4
1961:		1972:	
I.....	12.1	I.....	² -2.2
II.....	9.8	II.....	-9.4
III.....	9.4	III.....	-1.7
IV.....	8.2	IV.....	-20.0
1962:		1973:	
I.....	4.2	I.....	.4
II.....	5.6	II.....	6.3
III.....	6.9	III.....	10.6
IV.....	7.0	IV.....	12.5

See footnotes at end of table.

COUNCIL OF ECONOMIC ADVISERS

High employment budget^{1 3}

(Surplus (+), Deficit (-), \$ billions, S.A.A.R.)

1974:		1975:	
I.....	17.9	I.....	4 14.0
II.....	23.8	II.....	-34.9
III.....	32.0	III.....	-7.8
IV.....	27.9	IV.....	-6.8

¹ Information on the assumed rates of growth of potential GNP and other factors involved in the calculation of the full-employment budget can be obtained from past issues of the *Economic Report of the President*.

² The \$9.1 billion estimated increase in overwithholding of personal income taxes is not included in the 1972 estimates of full employment receipts. cf., *Economic Report of the President*, 1976, p. 55.

³ Latest C.E.A. estimates which may be different from the data presented in earlier issues of the *Economic Report of the President*.

⁴ In estimating full-employment expenditures, adjustments were made only for those outlays made pursuant to those provisions in the unemployment insurance laws which are regarded as permanent. Policy initiatives such as federal supplemental benefits and the special unemployment assistance programs are treated as discretionary by the C.E.A., even though these programs might be made permanent at a later date. For more information, see the *Economic Report of the President*, 1976, pp. 55-56.

Mr. NEAL. Do you concentrate more on interest rates than do other central banks?

Governor PARTEE. Less so, I think.

Mr. NEAL. Less so?

Governor PARTEE. It certainly is true, historically, and I think it is still true for the last few years. Everyone is moving toward more emphasis on aggregates. But, I think we have been ahead of most foreign countries in the attention we have given to that.

Mr. NEAL. Thank you very much for coming today. Your testimony has been very helpful to us.

Governor PARTEE. Thank you very much, Mr. Chairman.

Mr. NEAL. We will recess now, subject to the call of the Chair.

[Whereupon, at 12:27 p.m., the subcommittee recessed, subject to the call of the Chair.]

THE IMPACT OF THE FEDERAL RESERVE'S MONEY POLICIES ON THE ECONOMY

THURSDAY, JUNE 24, 1976

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON DOMESTIC MONETARY POLICY
OF THE COMMITTEE ON BANKING, CURRENCY AND HOUSING,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2128, Rayburn House Office Building, Hon. Stephen L. Neal [chairman of the subcommittee], presiding.

Present: Representatives Neal, Hannaford, Allen, and Hansen.

Also present: Dr. Robert Weintraub, staff director.

Mr. NEAL. Gentlemen, I am going to go ahead and start if it is all right with you. I will have to leave shortly and then return—however, our extremely able colleague from California will chair the subcommittee for me in my absence.

The subcommittee held hearings on the impact of the Fed's money policies on June 8, 9, and 10 and this morning we are continuing those hearings. Primarily, we are interested in learning whether increases and decreases in the money supply, which are decided by the Open Market Committee of the Federal Reserve, significantly affect the rate of inflation and production and employment. I have asked the staff to conduct indepth research into these questions. Preliminary results from several econometric experiments indicate that about 60 percent of our inflation is attributable to changes in money supply. For convenience, we have prepared an exhibit which illustrates the effects of fluctuations in money supply on inflation. The effects are mapped 23 months after actual changes in money supply growth occur. This 23-month lag was selected by computer studies, which show that the impact of changes in money supply on the rate of inflation are greatest at that time. Other more complicated experiments, involving money growth and the Federal deficit at several lags and changes in industrial production as well, reinforce the findings mapped in the exhibit—for instance, inflation rises and falls in the wake of increases and decreases in money growth.

Our exhibit also shows that recessions follow after sharp declines in money supply growth. Preliminary results from our other experiments lend support to the relationship depicted here between money growth and production and unemployment.

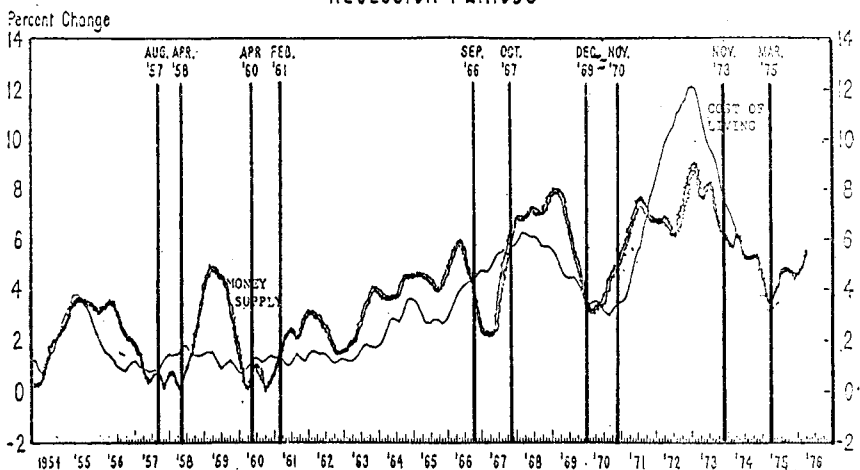
[An exhibit mapping M-1 money growth, the rate of inflation 23 months later and the recession periods experienced from 1954 to 1976 follows:]

YEARLY MONEY SUPPLY CHANGES

Percentage Changes From One Month in One Year to the Same Month in the Next Year

YEARLY CHANGES IN THE COST OF LIVING OCCURRING 23 MONTHS LATER

RECESSION PERIODS



As I noted, other factors that affect inflation, production and unemployment, such as the Federal deficit and interactions between inflation and production are also being researched. Our results to date indicate that the Federal deficit exerts some independent influence on our economy's performance. But it is a relatively weak influence compared to money growth. This finding does not condone excessive Government spending. Federal deficits are an important factor in our rate of inflation. It should be noted, however, that in the past, the Fed responded to the pressures of large deficits by creating more money to finance these debts. But by no means was the Fed required to do so; and in the past year, the Fed has proved that it can withstand pressures to monetize the deficit.

In our work, it is important not only to study the effects of changes in money supply, but to hear what outside experts have to say. Certainly, we hope that these hearings will provide increased knowledge in the area of monetary policy and guide us into more effective means of carrying out congressional oversight responsibilities in this area.

This morning we are pleased to welcome two very distinguished witnesses: Dr. James L. Pierce, who is a consultant with the Banking Committee, and Dr. Allan Meltzer of the Graduate School of Industrial Administration at Carnegie-Mellon University.

Let me make one additional comment if I may, gentlemen. We really are trying to be as objective as we can and we welcome comments which can help us better understand the economic consequences of increases or decreases in money supply.

We are very grateful for your coming this morning. Our hearings will continue and will be conducted as a forum for various points of view. So as we go along, if you have additional ideas that will help us, please never hesitate to let us know about them.

Dr. Pierce, we would like to hear from you first. Please proceed as you wish.

**STATEMENT OF DR. JAMES L. PIERCE, ECONOMIC CONSULTANT
AND PROFESSOR OF ECONOMICS, UNIVERSITY OF CALIFORNIA,
BERKELEY**

Dr. PIERCE. Thank you, Mr. Chairman.

Let me apologize in advance for having a relatively lengthy statement. I didn't have enough time to boil it down. So let me proceed with trying to go through it.

Fiscal and monetary policies are the two tools the Government has available to stabilize the Nation's economic activity. While the spending and taxing programs of fiscal policy are highly visible to the public, a mystique surrounds monetary policy. Nevertheless, there is a growing awareness by the public that monetary policy somehow has an important effect on the economic well-being of the Nation.

Virtually all economists agree that monetary policy is extremely important; they disagree on the relative strengths of monetary and fiscal policy. Some economists argue that monetary policy is of paramount importance and that fiscal policy has, at best, only a transient impact on economic activity. I, and many other economists, believe that fiscal policy has an important and more lasting impact on income, employment, and inflation. The extent of this impact, however, will be conditioned by the monetary policy that the Federal Reserve pursues. The effects of Government taxing and expenditure policies can be offset by monetary policy or they can be reinforced by it.

No matter what relative strengths various economists assign to fiscal policy, there is also general agreement in the profession concerning the importance of monetary policy in influencing inflation. The economy cannot experience sustained inflation without a monetary policy that underwrites it. The economy could not have enjoyed the low inflation rates of the 1950's and early 1960's had monetary policy created the rapid money growth of the past decade. Conversely, the high inflation rates of the past decade could not have occurred had the Federal Reserve pursued a growth in the money supply as low as that experienced in the 1950's and early 1960's.

Mr. HANNAFORD. Doctor, I don't like to interrupt you this early.

Dr. PIERCE. No, go ahead.

Mr. HANNAFORD. But we are almost as well off to just go on over now before you really get steamed up into this, and get back. I kind of enjoy this all-California team we have here, and of course, we have Mr. Allen from Tennessee.

[A brief recess was taken.]

Mr. HANNAFORD. The subcommittee will resume with the testimony of Dr. James L. Pierce of one of the great universities of the world.

Dr. Pierce, please proceed.

Dr. PIERCE. Thank you, Mr. Chairman.

Let me try to pick up where I left off, which was talking about the importance of monetary policy for determining inflation rates, and relating it to the growth in money over a period.

But I would like to hasten to add, there is more to monetary policy than the quantity of money. Such factors as bank reserves and

interest rates also play important roles. The importance that economists have come to attach to the money supply results, in part, from the difficulties that have been encountered in attempting to assess the implications of interest rates. The significance of interest rates in the economy; that is, whether a particular level of interest rates encourages expansion or contraction, depends at least in part upon the inflationary expectations that exist in the economy as well as the state of the economy as such. For example, interest rates normally should decline in a recession and rise during a boom, but the question remains, by how much? This is often very difficult to determine. Furthermore, it is perfectly possible that interest rates should remain high or even rise during recession if financial markets anticipate an acceleration in inflation rates.

This is not to say that the behavior of the money stock is a completely reliable guide either, particularly in the short run. There are times when the behavior of the money stock is extremely difficult to interpret. One need only look at the behavior of money growth relative to output and inflation in late 1975 and early 1976 to confirm this point. There was a near consensus that higher money growth than was actually achieved was required to obtain the rapid expansion in economic activity that we have recently experienced. But somehow a less than 3-percent growth in money has accompanied a more than 12-percent growth in nominal GNP and a nearly 7-percent growth in real output. Needless to say, this is not a normal pattern.

The behavior of money growth in 1974 is also an important example. The growth of money during that year was relatively high by historical standards, around 6 percent, but in light of the tremendous inflationary shocks the economy experienced, shocks from OPEC, lagged effects of decontrolling prices, the commodity boom and so on, this money growth was, in an economic sense, really quite low. Money grew at about half the rate that prices rose so that the same quantity of money had to finance a much larger volume of nominal transactions. As a result, the monetary policy during 1974 was highly contractionary and the economy responded by producing the most severe recession in the postwar era.

Historically, the Federal Reserve, like other central banks, has exhibited a strong tendency to stabilize fluctuations in interest rates, particularly short-run fluctuations. The Fed's penchant for stabilizing interest rates has among other things helped produce a procyclical behavior in the growth of the money stock; that is, money grows rapidly during economic expansion and slowly during recessions.

The reason for this is clear enough: when the economy is expanding rapidly credit demands also expand, tending to put upward pressure on interest rates. The Federal Reserve attempts to constrain these interest rate increases by providing more bank reserves through open market operations. The increase in bank reserves in turn leads to expansion in the money stock and underwrites an expansion in economic activity.

During recessions, credit demands decline and interest rates begin to fall; the Fed attempts to constrain the decline in interest rates by selling securities on the open market, therein reducing bank reserves and retarding growth in the money stock. The retardation of money growth and constraint on interest-rate declines tend to exacerbate the

decline in economic activity. It seems clear that attempts to stabilize interest rates can and have produced greater cyclical fluctuations in income, production, employment, and inflation than would have been the case had the Fed not been so concerned about interest rate fluctuations.

If the Federal Reserve adhered more closely to a target growth for the money stock, interest rates would tend to move more quickly; that is, fall more rapidly in recession and rise more rapidly in expansion than has heretofore been the case. These sharper interest-rate movements would serve to moderate the fluctuations in economic activity. If interest rates were allowed to react more quickly, aggregate demand would be affected more rapidly and hence would not probably fluctuate so widely. As a result, it is likely that interest rates would themselves actually fluctuate less widely.

It is precisely because interest rates have important implications for economic activity that many observers believe that the Fed should adhere more closely to a money path and adhere less strictly to constraining interest-rate fluctuations. This might produce sharper cyclical fluctuations in interest rates, but smaller fluctuations in the money stock and more importantly, economic activity. Thus, it is perfectly possible to subscribe to an apparent nonmonetarist position, that is, to stress the importance of interest rates, and at the same time argue for a more steady growth in the money supply. It is because of this consideration that the battle in the profession between monetarist and nonmonetarist economists is more a flight of fancy by the press than a matter of substance.

It is instructive to observe in this context how the Fed has responded to changes in the fiscal policy. Historically, the Federal Reserve has been highly accommodative of shifts in fiscal policy—it is expansionary when fiscal policy is expansionary and restrictive when fiscal policy is restrictive. While it is difficult, if not impossible for an outsider to determine why the Fed has behaved in this way, two reasons come to mind. First, the Fed has attempted to go along with the fiscal policy of the country. Second, swings in fiscal policy can have an important impact on aggregate demand in the economy and on interest rates.

The Fed attempts to circumscribe the movement of interest rates by speeding up money growth when aggregate demand is rising rapidly in response to fiscal policy and slow down money growth when interest rates are declining or not rising as rapidly when fiscal policy becomes less expansionary.

Whatever the cause, the record seems clear. There is only one important counter-example I am aware of and that occurred in 1975 when the Fed reacted strongly to the bulge in the money stock created by the tax cuts and rebates that occurred. In that situation interest rates rose sharply for a short period of time before they returned to a more sustainable level. That performance appears to be quite unusual.

Now, Mr. Chairman, I gave a fairly lengthy analysis of the relationship between money growth and Federal deficits in an effort to try to document my case that monetary policy has been accommodative, and rather than go through that, I will just submit it for the record and try to answer questions if there are any.

Mr. HANNAFORD. Proceed in whatever manner you would like.

Dr. PIERCE. Well, let's do it that way, then.

Let me just conclude by making just one point, and that has to do with the accountability of the Federal Reserve, which is on the last page of the testimony.

I would like to make the point that there are really two steps in assessing monetary policy, the first, to determine what the Fed is attempting to achieve by its actions in terms of employment, production, and inflation, and second, to determine whether its policies, for example, money growth, will achieve those ends. If these two steps are combined, one never knows whether a policy is technically wrong, that is, will not achieve the chosen ends, or whether it only appears to be wrong because perhaps you and I disagree with what the Federal Reserve is trying to do. Until one can unravel these two steps, it will be extremely difficult for any outsider including the Congress to assess and oversee the execution of monetary policy.

I would like to conclude by saying that I understand this subcommittee is interested in knowing how monetary policy is actually formulated. This is a large topic which I have only touched upon in my statement. I would like to submit two papers for the record, that describe in some detail how monetary policy is formulated, and I would be happy to answer any questions on this topic as well as any others that you care to ask.

[The prepared statement of Dr. Pierce and the above-mentioned papers follow:]

PREPARED STATEMENT OF DR. JAMES L. PIERCE, ECONOMIC CONSULTANT AND PROFESSOR OF ECONOMICS, UNIVERSITY OF CALIFORNIA, BERKELEY

Fiscal and monetary policies are the two tools the government has available to stabilize the nation's economic activity. While the spending and taxing programs of fiscal policy are highly visible to the public, a mystique surrounds monetary policy. Nevertheless, there is a growing awareness by the public that monetary policy somehow has an important effect on the economic wellbeing of the nation.

Virtually all economists agree that monetary policy is extremely important; they disagree on the relative strengths of monetary and fiscal policy. Some economists argue that monetary policy is of paramount importance and that fiscal policy has, at best, only a transient impact on economic activity. I, and many other economists, believe that fiscal policy has an important and more lasting impact on income, employment and inflation. The extent of this impact, however, will be conditioned by the monetary policy that the Federal Reserve pursues. The effects of government taxing and expenditure policies can be offset by monetary policy or they can be reinforced by it.

No matter what relative strengths various economists assign to fiscal policy, there is also general agreement in the profession concerning the importance of monetary policy in influencing inflation. The economy cannot experience sustained inflation without a monetary policy that underwrites it. The economy could not have enjoyed the low inflation rates of the 1950s and early '60s had monetary policy created the rapid money growth of the past decade. Conversely, the high inflation rates of the past decade could not have occurred had the Federal Reserve pursued a growth in the money supply as low as that experienced in the 1950s and early '60s.

But there is more to monetary policy than the quantity of money. Such factors as bank reserves and interest rates also play important roles. The importance that economists have come to attach to the money supply results, in part, from the difficulties that have been encountered in attempting to assess the implications of interest rates. The significance of interest rates in the economy—that is, whether a particular level of interest rates encourages expansion or contraction—depends at least in part upon the inflationary expectations that exist in the economy as well as the state of the economy as such. For example, interest rates normally should decline in a recession and rise during a boom, but the question is, by how much. This is often difficult to determine. Furthermore, it is perfectly possible

that interest rates should remain high or even rise during a recession if financial markets anticipate an acceleration in inflation rates.

This is not to say that the behavior of the money stock is a completely reliable guide either, particularly in the short run. There are times when the behavior of the money stock is extremely difficult to interpret. One need only look at the behavior of money growth relative to output and inflation in late 1975 and early 1976 to confirm this point. There was a near consensus that higher money growth than was actually achieved was required to obtain the rapid expansion in economic activity that we have recently experienced. Somehow a less than 3 percent growth in money has accompanied a more than 12 percent growth in nominal GNP and a nearly 7 percent growth in real output. This is not a normal pattern.

The behavior of money growth in 1974 is also an example. The growth in money during that year was relatively high by historical standards—around 6 percent—but in light of the tremendous inflationary shocks the economy experienced—from OPEC, lagged effects of decontrolling prices, the commodity boom, etc.—this money growth was, in an economic sense, quite slow. Money grew at about half the rate that prices rose so that the same quantity of money had to finance a much larger volume of nominal transactions. As a result, the monetary policy during 1974 was highly contractionary and the economy responded by producing the most severe recession in the post-war era.

Historically, the Federal Reserve, like other central banks, has exhibited a strong tendency to stabilize fluctuations in interest rates, particularly short-run fluctuations.

The Fed's penchant for stabilizing interest rates has among other things helped produce a pro-cyclical behavior in growth of the money stock—that is, money grows rapidly during economic expansion and slowly during recessions. The reason for this is clear enough: when the economy is expanding rapidly credit demands also expand, tending to put upward pressure on interest rates. The Federal Reserve attempts to constrain these interest rate increases by providing more bank reserves through open market operations. The increase in bank reserves in turn leads to expansion in the money stock and underwrites an expansion in economic activity. During recessions credit demands decline and interest rates begin to fall; the Fed attempts to constrain the decline in interest rates by selling securities on the open market, therein reducing bank reserves and retarding growth in the money stock. The retardation of money growth and constraint on interest rate declines tend to exacerbate the decline in economic activity. It seems clear that attempts to stabilize interest rates can, and have, produced greater cyclical fluctuations in income, production, employment and inflation than would have been the case had the Fed not been so concerned about interest rate fluctuations.

If the Federal Reserve adhered more closely to a target growth rate for the money stock, interest rates would tend to move more quickly, that is, fall more rapidly in recession and rise more rapidly in expansion than has heretofore been the case. These wider interest rate movements would serve to moderate the fluctuations in economic activity. If interest were allowed to react more quickly, aggregate demand would be affected more rapidly and, hence, probably would not fluctuate so widely. As a result, it is likely that interest rates would themselves actually fluctuate less widely.

It is precisely because interest rates have important implications for economic activity that many observers believe that the Fed should adhere more closely to a money path and adhere less strictly to constraining interest rate fluctuations. This might produce sharper cyclical fluctuations in interest rates but smaller fluctuations in the money stock and economic activity. Thus, it is perfectly possible to subscribe to an apparent "non-monetarist" position, that is, to stress the importance of interest rates, and at the same time argue for a more steady growth in the money supply. It is because of this consideration that the battle in the profession between monetarist and non-monetarist economists is more a flight of fancy by the press than a matter of substance.

It is instructive to observe in this context how the Fed has responded to changes in fiscal policy. Historically the Federal Reserve has been highly accommodative of shifts in fiscal policy—it is expansionary when fiscal policy is expansionary and restrictive when fiscal policy is restrictive. While it is difficult, if not impossible, for an outsider to determine why the Fed has behaved in this way, two reasons come to mind. First, the Fed has attempted to go along with the fiscal policy of the country. Second, swings in fiscal policy can have an important impact on aggregate demand in the economy and on interest rates.

The Fed attempts to circumscribe the movement in interest rates by speeding up money growth when aggregate demand is rising rapidly in response to fiscal policy and slow down money growth when interest rates are declining or not rising as rapidly when fiscal policy becomes less expansionary. Whatever the cause, the record seems clear. There is only one important counter-example I am aware of and that occurred in 1975 when the Fed reacted strongly to the bulge in the money stock created by the tax cuts and rebates. In that situation interest rates rose sharply for a short period of time before they returned to a more sustainable level. That performance appears to be quite unusual.

The more normal behavior of the Fed with respect to fiscal policy can be seen in Chart I. The top panel shows the high-employment surplus or deficit. These surpluses or deficits are an imperfect, but useful, measure employed by economists to assess the contribution to aggregate demand of fiscal policy. The high-employment deficit, rather than the actual deficit, is used because tax revenues vary with economic activity. During recessions, an actual deficit will be incurred simply because revenues have fallen even though expenditure levels and tax rates have remained unchanged. Such a deficit is not expansionary. The high-employment deficit adjusts for this effect by using not actual revenue figures but rather an estimate of the revenues that would have been generated if the economy had been producing at high levels of employment. The relationship of the high-employment measure to actual deficits or surpluses is shown in Chart II.

The bottom panel of Chart I shows the actual growth in the money stock. When one compares the two panels it is clear that when fiscal policy is highly expansionary, i.e., large high-employment deficits, money growth tends to be high. When fiscal policy is restrictive, i.e., large high-employment surpluses, money growth is low. Thus, the Federal Reserve underwrites fiscal policy. One can see this effect very strikingly in the second half of the 1960s. During that period, the Government was running large high-employment deficits at the same time that the economy was, in fact, highly employed. These policies contributed to the inflationary pressures that began to be felt by the end of the decade, and which we are still living with today. The fiscal policies of the late 1960s have been widely discussed and criticized but what has been mentioned much less frequently is that the Federal Reserve was underwriting these policies and was in essence monetizing the actual deficits, by purchasing the debt that the Treasury was issuing to finance the deficits. The result was rapid money growth and a further, and probably substantial, contribution to the inflationary pressures that were being put into place during that period.

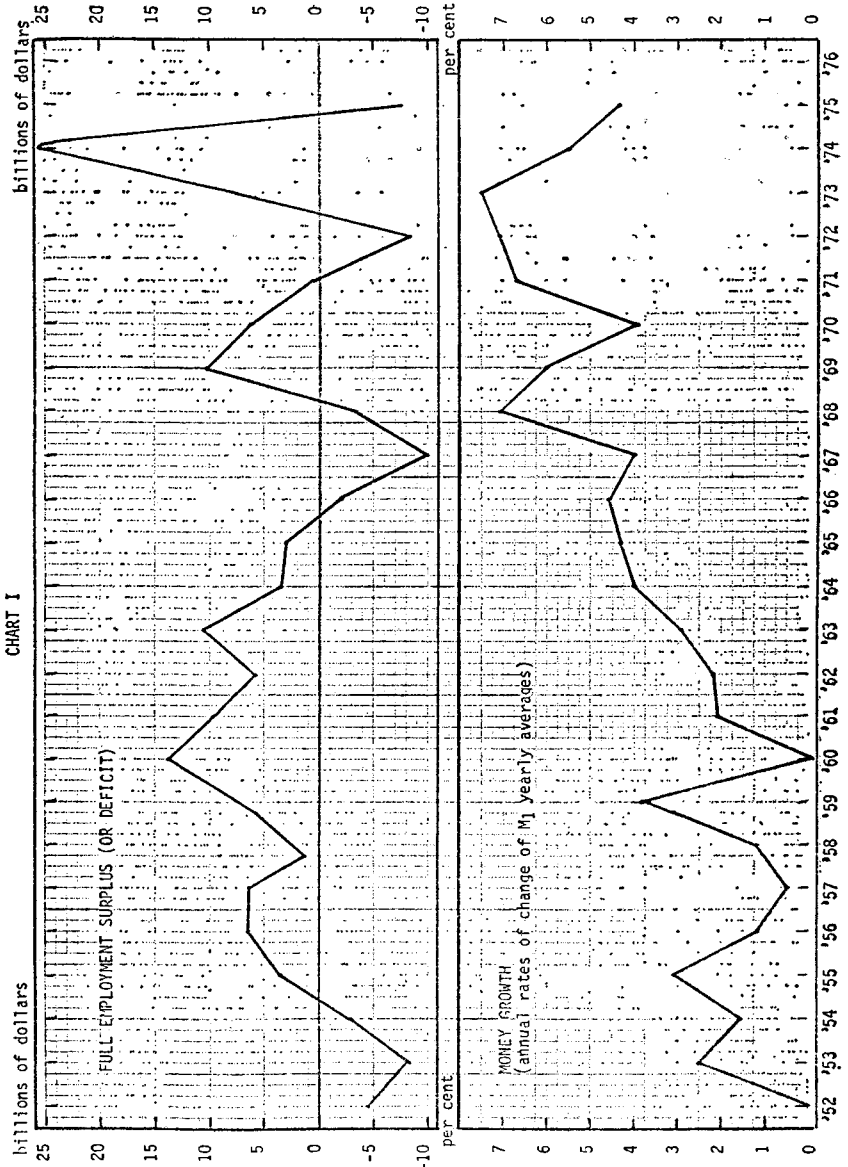
The relationship between money growth and actual deficits or surpluses would have told the same story as illustrated in Chart I, except that it would have been a little more difficult to discern. No matter what measure of deficits is used, the moral of the story is the same. Monetary policy has been highly accommodative of fiscal policy. This behavior of monetary policy makes one wonder just how independent the Federal Reserve really is.

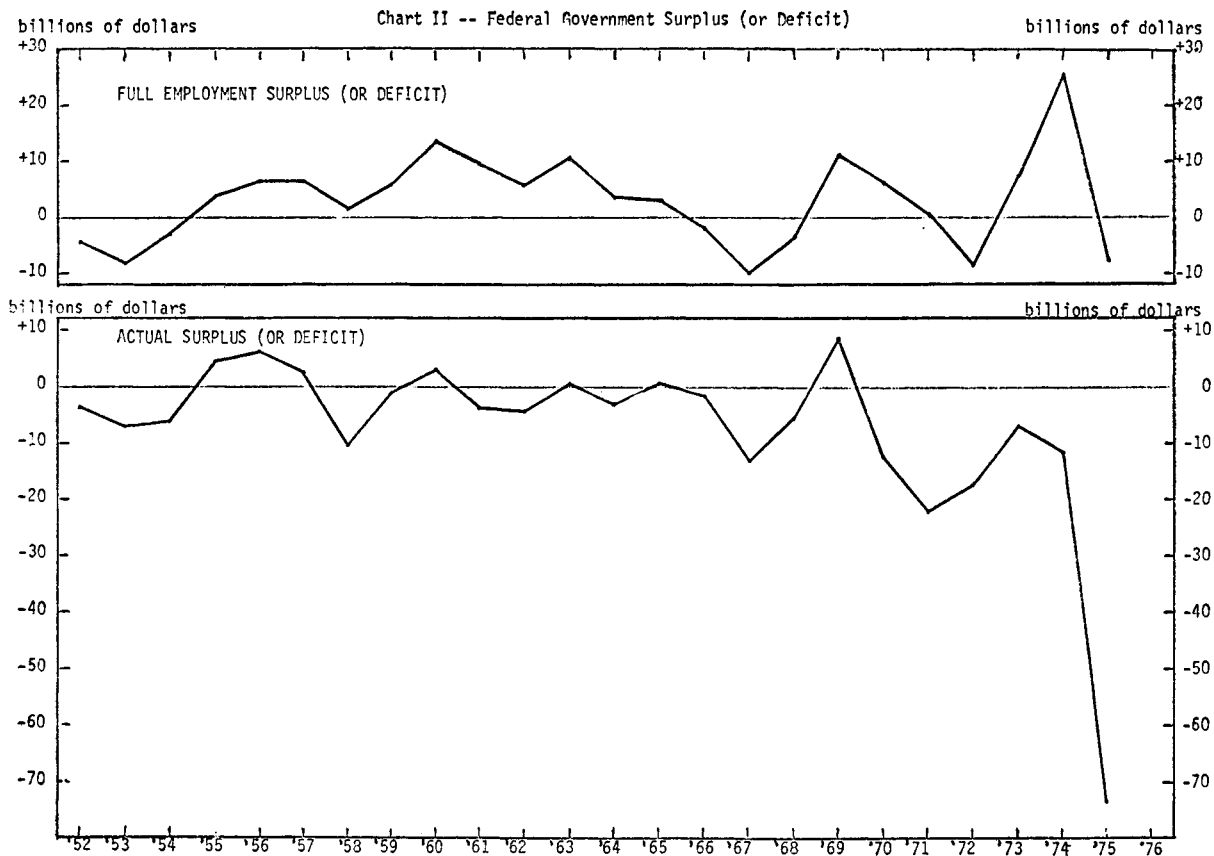
In my opinion it is up to the Congress and ultimately the electorate to determine whether or not the Federal Reserve should accommodate fiscal policy. No matter what the answer is to that question, however, it is fair to say that one cannot judge the impact of fiscal actions without knowing how the Fed will react to them. History suggests that it will accommodate fiscal policy, although the degree is unknown. The experience of 1975 suggests that at times monetary policy will attempt to offset fiscal policy. In either case, the effects of fiscal policy will be profoundly affected by what monetary policy does. I know of no way that the Congress and the Administration can go about determining appropriate fiscal policy without knowing the Fed's intent and how the Fed will react to various fiscal policies. If one knew what objectives the Fed sought to achieve in the economy one would have some basis for deducing how it might respond to changes in tax and expenditure policies. More generally, if one knew the Fed's objectives, one could deduce how it might respond to any change in the economic situation. Without such knowledge it is virtually impossible to evaluate general economic policy, including monetary policy.

It seems important to make an additional crucial point. There are really two steps in assessing monetary policy: first, to determine what the Fed is attempting to achieve by its actions in terms of employment, production and inflation and second, to determine whether its policies, e.g., M_1 growth, will achieve those ends. If these two steps are combined, one never knows whether a policy is technically wrong, i.e., will not achieve the chosen ends or whether it only appears to be wrong because it seeks to accomplish something that you or I disagree with.

Until one can unravel these two steps it will be extremely difficult for any outsider including the Congress to assess and oversee the execution of monetary policy.

I would like to conclude by saying that I understand this Subcommittee is interested in knowing how monetary policy is actually formulated. This is a large topic which I have only touched upon in my statement. I would like to submit two articles for the record that describe in some detail how monetary policy is formulated, and I would be happy to answer any questions on this topic as well as any others that you care to ask.





QUANTITATIVE ANALYSIS FOR DECISIONS AT THE FEDERAL RESERVE

(By Dr. James L. Pierce)*

[The purpose of this paper is to describe how policy analysis and advice is made at the Federal Reserve Board as well as to discuss the implications of the process for optimal control applications. An attempt is made to highlight those areas where control applications might make the greatest contribution to improving the policy-making process. Some of the problems that have been encountered in using control techniques at the Fed—problems with structural models and specification of objective functions—are pointed out along with some of the insights that these applications have provided.]

The way in which our work at the Fed bears on control theory applications can probably best be illustrated by discussing how policy analysis and advice is actually made at the Federal Reserve. To begin, it might be instructive to provide a description of the policy-making process itself.

Every month in Washington, there is a meeting of the Federal Open Market Committee (FOMC), which is the basic policymaking body of the Federal Reserve. This Committee is composed of the seven members of the Board of Governors plus five Federal Reserve Bank presidents. The presidents of the remaining seven Federal Reserve Banks also attend these meetings and freely enter into the discussion, but do not vote. Thus, there are twelve voting members on the Committee. Immediately, the severe problems involved in specifying an objective function for monetary policy can be seen: there are twelve individuals with twelve separate sets of preferences trying to reach a single decision. Somehow, however, decisions do get made. The FOMC decides upon open market operations—the purchases and sales of Government securities, which are made daily in New York—that affect directly commercial bank reserves in the economy. This is the primary vehicle through which monetary policy operates.

In addition to the FOMC, the seven members of the Federal Reserve Board formally meet together several times a week and—among their other duties—decide upon reserve requirements and approve discount rate changes, two additional monetary policy instruments. But because these actions are carefully coordinated with the activities of the Committee, for purposes of this discussion, the FOMC will be considered to be the ongoing policymaking body.

The staff periodically makes several kinds of presentation to the FOMC. They will all be discussed in some detail here because each of them may provide some insights for control applications.

Three or four times a year, depending on the behavior of the economy, a major effort is made to prepare quarterly forecasts of the economy for the FOMC. These usually run 4 to 6 quarters into the future. The forecasts are not extended any further because generally not much credence is put in longer-run forecasting. I must admit, as someone who has tried to do forecasting, I share these sentiments. This basic forecast is conditional on explicit assumptions concerning monetary policy.

To begin its analysis, the staff makes a conditional forecast that contains some kind of simple policy assumption. For instance, it may be assumed that a particular growth path for the money stock will obtain during the period, or maybe a simple pattern in interest rates is taken as the policy. Given this basic assumption, we run our econometric model—which is our own version of the FMP (FRB-MIT-Penn) model—and obtain a set of results after judiciously adjusting the constant terms in equations that have not been tracking well. These adjustments can be justified as a means of building in prior information to make a conditional forecast for a specific future time period.

At the same time, another forecast is being made by judgmental means—i.e. without aid of a formal model. Judgmental forecasters at the Fed usually have a very good feel for what is going on in the economy, and they often make better short-term forecasts than the models do. The judgmental forecast is compared to the model forecast. The differences between the two forecasts often lead to insights and revisions in each forecast. A consensus forecast is then arrived at that is a blend of the forecasts obtained from the two methods.

The consensus forecast provides figures for such target variables as GNP and its major components, the unemployment rate, and the rate of inflation. At this point, the quarterly model is adjusted in terms of intercept shifts in individual equations so as to force its sectors and totals to agree quarter by quarter with the consensus forecast. Once these adjustments are made, we run policy alternatives off of the adjusted form of the model.

*Associate Director, Division of Research and Statistics, Board of Governors of the Federal Reserve System. The opinions expressed here are my own and do not necessarily reflect those of the Federal Reserve Board or its staff. I wish to thank Mary Ann Graves for her valuable help and advice in converting the original taped version of this talk into an intelligible form for publications.

Because we normally do not have to adjust the model very far in order to make it agree with the consensus forecast, these adjustments have virtually no effect on the multipliers in the model, even though the model is nonlinear. Thus, the policy alternatives applied to the adjusted form of the model give us, for all intents and purposes, the same marginal effects as would occur if we had not adjusted the model to begin with. Its multipliers are left intact, but the adjustments allow us to talk about a common level of the target variables.

The policy alternatives may be for different growth paths of a monetary aggregate, such as the money stock, or for different patterns of an interest rate. In the interests of clarity, this discussion will focus on the money stock. Alternative growth paths of the money stock can be handled very conveniently with our neo-Keynesian model. We usually run several alternatives—an easier alternative, a tighter alternative, and then different time paths in between. This gives the FOMC some feel for what the tradeoffs are among important target variables such as employment, output, and the inflation rate.

We also do alternative simulations for those sectors about which we feel particularly uncomfortable or uncertain. One of our biggest problems is predicting fiscal policy over the policy horizon. As you know, in the United States, monetary and fiscal policy are determined separately. The Fed has to predict fiscal policy just as anybody else does (including the President and Congress), and we sometimes make large errors in the predictions. Currently, for example, we have to guess whether the President's impounding scheme will or will not work, how Congress will react, and whether more or less money ultimately will be spent. When uncertainty about fiscal policy is particularly pressing, we work out various assumptions about the fiscal sector to examine the implications for some given monetary policy. In addition to the bothersome fiscal sector, there are times when we feel uneasy about a particular co-determined variable, like inventory investment. At that time, we may try different patterns of inventory investment, again, to see what the implications of variability in that sector are for the selection of a particular policy.

By the end of this process, the staff has compiled a large number of alternatives. However, there is a real limit to the number of alternatives that can be presented to any audience. A welter of detail seems to cause more confusion than assistance. While the entire exercise is quite useful to the staff, the presentation to the FOMC must be more limited. Thus the staff determines what are the crucial issues at the time, and presents the results relevant to those issues.

On the basis of the staff's presentation and its own evaluation of events, the FOMC sets a policy for the next six months or more in terms of say, the growth path of the money stock. In principle, the FOMC's longer-run strategy can be updated each month: in practice, however, it does not change that often—for no other reason than new and useful information does not arrive on a monthly basis. While we do not go through a full-scale forecasting and policy alternative analysis each month, we do update our forecast for each meeting based on the policy trajectory previously chosen by the Committee and on any new data. As events warrant, the FOMC does change its basic policy trajectory.

I would like to point out that while we have never formally presented an optimal control solution to the FOMC, we have produced such solutions for a certainty version of our model. The outcome has been very useful in designing policy alternatives and as background for policy advice. In the cases studied so far it has been possible to come very close to the optimal solution with some very simple policy moves. One of our big fears had been that in the optimal solution, the money stock or interest rates might explode right off the charts. Of course the policymakers would not believe this sort of result, and probably rightfully so. In fact, however, we have been able to come very close to an optimal trajectory with quite a gradual and smooth movement in the path of both interest rates and the money stock. Thus, even in a rudimentary form, we have found these exercises to be very helpful.

While the FOMC meets once a month, its open market operations go on daily. Thus, every month, the Committee must decide upon its "operating strategy," that is, it has to give instructions to the trading desk in New York, where securities are actually bought and sold, as to what to do during the month that will lapse before the next Committee meeting. These instructions are composed of two parts. First, the Committee states its decision regarding its longer-run strategy, say, some growth path in the money stock. Then it must decide about how to return the targeted variable—whether the money stock or an interest rate—to the desired path when it strays off course. For instance, the money stock is very rarely exactly on course because it cannot be determined with complete accuracy. The FOMC's decision on how quickly to bring the money stock back towards the desired longer-run path is not independent of its decision concerning the variability in short-term

interest rates that it will tolerate—or vice versa. Thus, there is a tradeoff between control of the money stock, or any other monetary aggregate, and variability of short-term interest rates.

Each month the staff presents short-run operating strategy alternatives to the FOMC in very much the same manner that it presents longer-run GNP projections. Namely, we have a model, a form of which was described by Pindyck and Roberts at this conference, that is used to generate monthly forecasts of the money market. The forecasts are conditional on income estimates derived from the quarterly forecast and on a specific pattern of bank reserve growth. The forecasts from the monthly model are blended with independent judgments (along with the results of other models) to arrive at a set of alternatives to present to the FOMC. For instance, if the money stock is off track, then the alternatives are in the form of various growth paths of bank reserves required to move the money stock from its current value back to the desired long-run path over different time horizons. Predictions of the implication for short-term interest rates of the various alternatives are also presented. The more quickly that the money stock is brought back to the long-run path, the greater will be the movement in interest rates, other things equal. Since there is some concern about interest movements in their own right, the estimated tradeoff between hitting the money stock target and movements in interest rates are also presented. On the basis of this presentation and its own evaluation of the money market, the FOMC decides on its short-run operating strategy.

In general, the longer-run movements in the money stock, or some other monetary aggregate, are viewed as stabilizing the economy (income, employment, and inflation), and the shorter-run movements, in part, are viewed as stabilizing the money market (e.g., short-term interest rates). One can think of the situation in terms of spectral analysis: the high frequency movements in the money stock are really those used to stabilize the money market and the low frequency ones are used to stabilize the economy. There is a conflict between these movements in the money stock, but the conflict need not be very great so long as the money stock tends to fluctuate evenly around the long-run trajectory. Sometimes this is not so, and the money stock gets too far off the trajectory to allow it to be returned in any short period of time without unacceptable movements in interest rates. As a result, longer-run stabilization policy itself may be affected. Unfortunately for our purposes, the money stock is not solely set by the Federal Reserve but rather is co-determined in the economy; it is the path of bank reserves that is under policy control. While the stock of money is highly influenced by Federal Reserve policy, it is still difficult both to predict and control. Furthermore, the money stock is not the only intermediate target for monetary policy; interest rates, credit conditions, etc. also compete for the FOMC's consideration. When these other factors are given heavier weight, the money stock can stray even farther from its predetermined growth path—perhaps, with no cost to the objectives of policy.

I would like to suggest some implications of these procedures for optimal control applications. The first concerns the use of an intermediate target variable as a means for obtaining the ultimate ends of monetary policy. The FOMC really makes two decisions: it makes the decision as to what is the preferred time path of the economy, and then makes the decision as to what intermediate target, say, the growth path in the money stock, will be consistent with this goal. In other words, it aims at the money stock—or at other times interest rates—as a vehicle for accomplishing its ends with respect to the real sectors of the economy.

It is not obvious that this is the appropriate thing to do. One is certainly entitled to ask: why not go directly from the true instruments of policy (open market operations, the discount rate, and reserve requirements) to the real economic targets? Why go through this intermediate vehicle at all? Clearly, this sort of procedure would not make any sense in a world of certainty, where we knew the exact relationships between the instruments and the ultimate targets. To the contrary, however, we operate in a world with a high degree of uncertainty. The rationale for using an intermediate target lies in the fact that its data are more frequently available than are data on the real sectors; movements in the intermediate target can provide early information on how the real sectors are responding to policy. In addition, it must be under some degree of policy control and it must be causally related to the ultimate objectives of policy. Thus, the difficulty or ease with which a target for the money stock can be hit in a particular situation, presumably, indicates what is happening in the real sectors. While this idea of using an intermediate target has appeal, no one has proved that it is appropriate.

One very useful application of optimal control procedures would be to analyze the conditions under which it is desirable to use an intermediate target for monetary policy. Furthermore, if these conditions are likely to exist, what is the best intermediate target to use? If the conclusion were to be that it is never or hardly

ever appropriate to use an intermediate target variable, then it is important to know the costs incurred by pursuing one.

The next issue I want to discuss is uncertainty in general. It is difficult to overemphasize the degree of uncertainty with which policy decisions must be made. A high degree of uncertainty concerning future values of exogenous variables is one of the reasons why it is difficult to make reliable forecasts very far into the future. The forecasting errors in the exogenous variables become so large, or at least the variance around some expected value becomes so large, that the worth of our GNP projections diminishes greatly as the forecast horizon is extended.

Another area of uncertainty has to do with our models. I want to stress this because users of control theory often tend to take models as given and work out solutions without seriously questioning the reasonableness of the models. This tendency is not very harmful when one is working on technique. However, there is a real danger of giving more credence to model results than they deserve, especially if a particular policy trajectory is highly influenced by the choice of a model.

The problem lies not only with uncertainty concerning the true value of model parameters, but also with the structure of models themselves. I cannot state with much certainty that we have a good approximation to the economy with our models at the Federal Reserve Board. I have even more doubt about other models that are used for policy analysis. My particular concern involves whether or not we have correctly approximated the impact of monetary policy in the models. For example, we have found that with some relatively minor changes in the specification of our quarterly model—changing just three or four equations—we can importantly alter its policy multipliers; I believe this is true of other models as well. A couple of examples should make the point.

We have a wide variety of money demand functions from which we can choose, all estimated with about the same R^2 , with about the same standard error of estimate, and all about as intuitively sensible or unsensible as the other. However, the results from the full model are quite different just because of the different interest elasticities of money demand implied by these functions. The way that this and other structural models work is to impose clearing in the money market; short-term interest rates must move sufficiently to equate money demand with money supply. Other things equal, the smaller the short-run interest elasticity of money demand, the greater the movement in interest rates required to induce the public to change its holdings of money balances by a given amount. For a given change in the growth in the money stock, different money demand functions with their different elasticities will imply different changes in short-term interest rates. The changes in short rates then feed to longer-term rates, to wealth, and to spending. Thus, the short-run impact of a change in the money stock predicted by the model will depend rather crucially on the money demand function selected. At this time, we simply have no reliable guidelines to help us choose among the functions available.

Another example is provided by the model's consumption function. Theoretically, consumption should depend upon wealth and it does in our model. Unfortunately, as soon as we have consumption dependent upon wealth, we have to predict the impact of monetary policy on the stock market, because the major component of the variance in wealth is the variance in stock prices. Given a choice, I think any of us would far prefer to just go ahead and forecast consumption than to forecast the stock market. However, because we would be losing a major channel through which monetary policy works by leaving wealth out, we leave it in. We then have all kinds of *ad hoc* procedures for explaining the stock market. The way that the stock market is specified to adjust to monetary policy variables is crucial to estimating the impact of these variables on consumption and hence, GNP. Again we have no reliable means of selecting the "correct" specification.

Another question I want to raise is: what is an acceptable way of evaluating a model? How do we know when it is right? There are many models that explain their sample period well and also do pretty well outside the sample period, but which differ drastically in their specifications and also in their implied policy multipliers. Unfortunately, there is no very reliable method of choosing among alternative models. In a related vein, we have learned that individual structural equations might look sensible, but when they are put together in a full model, they can give some very strange results. Thus, it becomes very difficult to know when an equation is good nor not. Should it be judged as an individual equation or in terms of how it contributed to the full model?

An excellent case in point has to do with stability of models. Should one impose stability on a model or not? By stability, I mean if the model is shocked with, say, a permanent change in the growth rate of the money stock, does the model go through explosive cycles? The real world might be like that, but then again it may not. It is not possible to know because the real world never gets shocked in the way that models are shocked. Instability *per se* does not bother control theorists

because they point out that the system can be stabilized even though it is structurally unstable. Perhaps that may be what happens in the economy. Perhaps the economy is inherently unstable but policy at least has been good enough on average to keep it from exploding. It is difficult to determine where the truth lies. The problem is clearly an important one because the kind of stability conditions imposed will have implications for a model's dynamic policy multipliers. It seems fair to say that there is no firm basis for knowing what kind of stability conditions to impose on our models, if any.

There is an additional problem that plagues any user of models for forecasting and policy analysis. There is no solid basis for establishing a practical method of incorporating prior information into models. This information comes from such sources as recent performance of the model, judgmental assessments of the economy, and special survey information. Adjustments of a model's constant terms is a rough and ready way to deal with this problem, but the method is clearly deficient. Slope coefficients as well as intercepts should be adjusted when appropriate. The development of better procedures for incorporating prior information would provide a major contribution to policy analysis.

At this point I would like to offer a few comments about the objective function used in the formulation of monetary policy. As mentioned earlier, it is particularly difficult to talk about "the" objective function because there are really twelve objective functions on the FOMC, and there has to be a majority of people on the Committee to agree on policy. The different ways that the Committee members grapple with uncertainty often condition disagreements more than their basic underlying objectives. For instance, if someone places a high weight on avoiding high inflation rates, he will be very worried that somehow future inflation rates have been underestimated. He will be willing to pay a relatively high penalty, in terms of higher expected unemployment rates, in order to avoid a bad draw in the sense of getting inflation rates greater than anticipated. The same sort of argument applies to a member who is worried about unemployment. Being central bankers and being in a position where decisions have to be made, the Committee members are risk averse—they are willing to trade off expected value for decrease in variance.

Their aversion to risk often takes the form of restricting movements in policy instruments. This occurs not because instrument stability is necessarily valued *per se*, but rather stems from a fear of going outside the range of experience. These particular restrictions, then, do not belong in the objective function. By restricting movements in its instruments, the FOMC has in a sense solved its own control problem. I think there is too much tendency on the part of researchers doing control applications simply to assume that there should be a penalty cost on movements in the instruments, and then justify this assumption by observing that the instruments, in fact, have not moved very much in the real world. This procedure precludes us from ever being able to demonstrate whether or not the movements have been too restrictive.

For monetary policy, there really is no cost (in an economic resource sense) of large movements in the reserve instrument. It is no more costly to buy a billion dollars of Government securities per unit than to buy a thousand dollars worth, and there are probably great scale economies. Thus, movements in bank reserves do not belong in the objective function. It is true that policymakers worry about short-term variability of interest rates and, at times, about the level of rates. These interest rate considerations should appear in the objective function, or at least as side conditions in a control problem.

Three additional observations concerning objective functions may be in order at this point. First, it is very difficult to convince a policymaker to move an instrument in what he views to be the wrong direction. That is to say, if income is expanding very rapidly and the models are predicting that it is going to fall in the future unless he eases up, it is very difficult to get him to ease up because that sort of policy recommendation is contrary to what is going on currently. I must say that until our models do a lot better, his wariness may be justified. Again, the problem is one of how to handle risk: what if the model were wrong? What if the economy were expanding very rapidly, the policymaker eases up, but economic expansion becomes more rapid? The cost of the error to the policymaker would be very large.

Second, I have observed over time that risk aversion on the part of the policymakers leads to risk aversion on the part of those giving advice. The reason is very simple: if advice is followed and it turns out to be wrong, the policymakers probably will not listen next time. Thus, the people giving advice also have a loss function that further compounds the risk aversion. As a result, policy advice often goes only part way, trying to point policy in what appears to be the right direction. Contrary to the opinion of some observers, policy advisers are not in the habit of recommending "fine tuning" of the economy.

Third, for optimal control studies, we need to know how crucial the weights are in the loss function. We have done a few optimal control experiments in this area using our quarterly model; they indicate that at least for some initial conditions, the choice of weights is not very important. In these experiments, wide variations in the relative weights assigned to the unemployment rate and the rate of inflation resulted in surprisingly similar optimal policy trajectories. The reason that this result occurs is that the inflation rate responds much less rapidly to changes in policy variables than does the unemployment rate. In the longer run, however, the effect of monetary policy is much more powerful on the rate of inflation. Thus, even if the unemployment rate receives a relatively large weight in the objective function, an attempt to bring it quickly back to target will set in train forces leading ultimately to a relatively large rise in inflation above its target. Thus, so long as the inflation rate receives a weight in the objective function, it will reduce the incentive to move the unemployment rate quickly to its desired value, although some movement is desirable. In the longer run, small changes in the unemployment rate are associated with relatively large changes in the rate of inflation, so again the inflation rate must enter importantly in computing the loss.

This would be a very powerful result if it held for a large number of initial conditions. It would indicate that researchers would not have to worry so much about getting the correct weights in the objective function. The result would also be a demonstration of the robustness of the technique of optimal control. If it turned out that the technique depended crucially on these weights, however, then it becomes much weaker because we really have no way of knowing what the weights are.

I would like to conclude my remarks with some observations on the complexity of models used for control applications. There seems to be a great desire among economists to work with the newest and biggest models. It is particularly difficult to work with new models, especially if they are large, because their properties are not well known and because their sheer size leads to severe technical problems. The Federal Reserve only has about two or three instruments, so we are not terribly interested in looking at results where sixty different instruments can be varied. It would be extremely productive if we could talk in a more meaningful way about movements in real output, employment, and inflation in response to variations in one instrument. There probably is a very substantial payoff to working with smaller models that describe the behavior of those two or three target variables and their relation to a policy instrument. The use of small models would clear away a great deal of the pure technical problems, particularly in stochastic control problems. It is not at all clear to me that larger models are needed in order to carry out this kind of experiment. In fact, we are currently engaged in efforts to come up with a scaled down version of our own quarterly model. Hopefully, we will then be able to do control problems more efficiently than we have been able to do in the past.

I would like to conclude by saying that I think the work on optimal control is very promising, and our applied work at the Fed indicates that control techniques can and will provide important contributions toward solving stabilization problems.

Board of Governors of the Federal Reserve System.

[From *Open Market Policies and Operating Procedures—Staff Studies*, Board of Governors of the Federal Reserve System, July, 1971.]

MONETARY AGGREGATES AND MONEY MARKET CONDITIONS IN OPEN MARKET POLICY

(By Stephen H. Axilrod)

There has been widespread discussion over the past year or so about the emphasis given to monetary and credit aggregates, as compared with traditional operating variables such as money market conditions, in the formulation and conduct of the Federal Reserve System's open market policy. This article discusses the role—in the decisionmaking process of the Federal Open Market Committee (FOMC)¹ and in the day-to-day conduct of Federal Reserve open

¹ The Federal Open Market Committee is the statutory body responsible for open market operations (purchase and sale of U.S. Government securities in the open market), the most flexible and frequently used instrument by which monetary policy affects bank reserves, bank credit, money supply, and ultimately over-all credit conditions. The FOMC consists of the seven members of the Board of Governors of the Federal Reserve Bank of New York, and four of the remaining 11 Reserve Bank presidents serving in rotation. The Chairman of the Board of Governors has traditionally been elected by the Committee to serve as Chairman of the Open Market Committee, and the President of the Federal Reserve Bank of New York has traditionally been elected Vice-Chairman.

market operations—of aggregates such as the money supply and bank credit in comparison with other financial variables. Such aggregates, of course, represent only a few of the many financial variables, including interest rates and credit flows through nonbank institutions and the market directly, that are evaluated in monetary policy decisions and their implementation. And financial conditions as a whole are evaluated against the underlying purpose of monetary policy—the encouragement of a healthily functioning economy, both domestically and in relation to the rest of the world.

The policy decisions of the FOMC are based on a full-scale evaluation by Committee members of likely tendencies in critical measures of economic performance such as output, employment prices, and the balance of payments. In deciding on the stance of monetary policy, the Committee considers whether these tendencies in domestic economic activity and the balance of payments appear desirable, and if not, how they might be influenced by changes in financial conditions—including the pace of monetary expansion, credit availability, interest rates—and by expectational factors. Once a general policy stance is adopted guidelines are set for the day-to-day conduct of operations in the open market. During 1970 somewhat more emphasis was placed on the behavior of monetary aggregates—such as the money supply and bank credit—in providing guidance for the day-to-day conduct of open market operations.

Since it has always been recognized that the effect of monetary policy stems from its influence on bank credit, money, interest rates, and financial flows generally, the greater emphasis placed on monetary aggregates basically represented a modification of operating procedures rather than a change in the fundamental objective of policy. Under conditions of uncertainty—for example, uncertainty about the impact on interest rates of expectational factors or about the strength of future demands for goods and services—some emphasis on the aggregates helps to guard against the risk that open market operations might in the end supply either too large or too small amounts of bank reserves, credit, and money as a result of unexpected and undesired shifts in demands for goods and services and for credit.

At the same time, however, an approach that utilizes aggregates as one operating guide must take account of shifts in the demand for money and liquidity at given levels of income. Such shifts would have to be accommodated through open market operations in order to help provide the money and liquidity demanded if interest rates and credit conditions generally were not to become unduly tight or easy. Thus, the longer-run path for monetary aggregates needs to be evaluated in relation to emerging credit conditions and tendencies in economic activity, to help determine if demands for liquidity have been properly assessed. And whatever longer-run path for the aggregates may be included as guidance for open market operations, short-run, self-correcting variations in money and credit demands need to be accommodated in order to avoid inducing unnecessary, and possibly destabilizing, fluctuations in money market conditions.

In practice, allowance has to be made—in the formulation of monetary policy and in the guides to the conduct of policy—for uncertainties with respect to both the demand for goods and the demand for money and liquidity. And trends in monetary aggregates, interest rates, and other financial variables have to be evaluated in relation to the continuing flow of evidence as to the likely course of economic activity.

DIRECTIVES OF THE FOMC

The monetary policy decision of the FOMC—which in recent years has generally met about every 4 weeks—are embodied in the Committee's current economic policy directive, voted on near the end of each meeting. This directive is issued to the Federal Reserve Bank of New York, which, because it is located in the Nation's central money and credit market, undertakes open market operations for the Federal Reserve System. The directive is carried out by a senior officer of the Bank, who is designated by the FOMC as Manager of the System Open Market Account.

Both the form and the content of the FOMC directive have changed over the years. Since 1961 the directive has contained two paragraphs. The first paragraph has contained statements about recent key economic and financial developments,

and also a general statement of current goals of the FOMC with respect to economic growth, price stability, and the balance of payments.² The second paragraph contains the FOMC's instructions to the Account Manager for guiding open market operations in the interval between FOMC meetings. The second paragraph is, in essence, a highly condensed summary of the Committee's discussion and conclusions as to the sort of operations that will be required to reach its longer-run policy goals. These directives are made public after a 3-month lag in a "record of policy actions," which also includes a resume of prevailing economic and financial conditions and of the Committee's discussion of policy implications at the meeting.

The nature of the operating instructions in the second paragraph of the directive has changed from time to time. Money market conditions have remained as important guides in determining day-to-day open market activity. Though emphasis on various money market indicators has varied over the years in light of changing economic and financial circumstances, money market conditions have generally been construed to include member bank borrowings at the Federal Reserve discount window, the net reserve position of member banks (excess reserves of banks less borrowings from the Federal Reserve), the interest rate on Federal funds (essentially reserve balances of banks that are made available to other banks, usually on an overnight basis), and at time the 3-month Treasury bill rate.

At times when it was framing the operating instructions contained in the second paragraph of its directive solely in terms of money market conditions, the FOMC was nevertheless concerned with developments in monetary aggregates and financial conditions generally as they affect the broad objectives of policy. Beginning in 1966, the Committee supplemented the reference to money market conditions in the second paragraph with a reference to certain monetary aggregates, such as bank credit, and later the money supply.³ The desired behavior of aggregates has been given increased emphasis since early 1970.

From mid-1966 through 1969 the reference to aggregates was generally to bank credit and was contained in a so-called proviso clause. The second paragraph of the directive issued on December 16, 1969, is illustrative:

"To implement this policy, System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining the prevailing firm conditions in the money market; provided, however, that operations shall be modified if bank credit appears to be deviating significantly from current projections or if unusual liquidity pressures should develop."

In 1970 monetary aggregates came to play a more prominent role in the phrasing of the second paragraph, and references were made to the money supply as well as to bank credit. In the directive issued on March 10, 1970, the Committee stated more directly its desires with respect to the aggregates rather than referring to them in the form of a proviso clause. The second paragraph of the directive of that date read as follows:

"To implement this policy, the Committee desires to see moderate growth in money and bank credit over the months ahead. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining money market conditions consistent with that objective."

The operating instructions in the second paragraphs of FOMC directives are not confined to money market conditions and a desired pattern of behavior in the monetary aggregates. The System Account Manager has also been directed, when appropriate, to take account of Treasury financings, liquidity pressures, and the

² For illustrative purposes the first paragraph of the directive issued on Dec. 16, 1969, is quoted below: "The information reviewed at this meeting indicates that real economic activity has expanded only moderately in recent quarters and that a further slowing of growth appears to be in process. Prices and costs, however, are continuing to rise at a rapid pace. Most market interest rates have advanced further in recent weeks partly as a result of expectational factors, including concern about the outlook for fiscal policy. Bank credit rose rapidly in November after declining on average in October, while the money supply increased moderately over the 2-month period; in the third quarter, bank credit had declined on balance and the money supply was about unchanged. The net contraction of outstanding large-denomination CD's has slowed markedly since late summer, apparently reflecting mainly an increase in foreign official time deposits. However, flows of consumer-type time and savings funds at banks and nonbank thrift institutions have remained weak, and there is considerable market concern about the potential size of net outflows expected around the year-end. In November the balance of payments deficit on the liquidity basis diminished further and the official settlements balance reverted to surplus, mainly as a result of return flows out of the German mark and renewed borrowing by U.S. banks from their foreign branches. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to the reduction of inflationary pressures, with a view to encouraging sustainable economic growth and attaining reasonable equilibrium in the country's balance of payments."

³ There was also occasional reference to such aggregates in directives during the first half of the 1960's.

possible impacts of bank regulatory changes in the process of achieving satisfactory conditions in the money market and satisfactory performance of monetary aggregates.

As the nature of economic and financial problems has altered, so has the phrasing of the second paragraph of the directive. For instance, the second paragraph of the directive issued on May 26, 1970, emphasized the need to moderate pressures on financial markets; it read as follows:

"To implement this policy, in view of current market uncertainties and liquidity strains, open market operations until the next meeting of the Committee shall be conducted with a view to moderating pressures on financial markets, while, to the extent compatible therewith, maintaining bank reserves and money market conditions consistent with the Committee's longer-run objectives of moderate growth in money and bank credit."

The short-run bulge in bank credit expansion expected to result from the Board's action around midyear in suspending ceilings on maximum interest rates payable by banks on large certificates of deposit in the 30- to 89-day maturity range was taken into consideration in the phrasing of the second paragraph of the directive issued by the FOMC on July 21, 1970:

"To implement this policy, while taking account of persisting market uncertainties, liquidity strains, and the forthcoming Treasury financing, the Committee seeks to promote moderate growth in money and bank credit over the months ahead, allowing for a possible continued shift of credit flows from market to banking channels. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with that objective; provided, however, that operations shall be modified as needed to counter excessive pressures in financial markets should they develop."

And in the directive issued on August 18, 1970, an easing of conditions in credit markets was taken as an objective of open market operations parallel with desires with respect to monetary aggregates, as follows:

"To implement this policy, the Committee seeks to promote some easing of conditions in credit markets and somewhat greater growth in money over the months ahead than occurred in the second quarter, while taking account of possible liquidity problems and allowing bank credit growth to reflect any continued shift of credit flows from market to banking channels. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with that objective, taking account of the effects of other monetary policy actions."

The first and second paragraphs of all directives issued from December 16, 1969, through December 15, 1970, are shown in the appendix to indicate the variety of considerations that the FOMC takes into account in formulating its policy and framing its operating instructions.

POLICY FORMATION

The FOMC's basic concern is with the real economy—production, employment, prices, and the balance of payments. But the Committee must translate its broader economic goals into the monetary and credit variables over which the Federal Reserve has a direct influence. Thus, whatever emphasis is given to the financial variables that influence day-to-day open market operations, it is recognized that the immediate targets of day-to-day operations are not the goals of monetary policy, but rather that those targets are set with a view to facilitating the achievement of the broader financial and economic objectives of the FOMC.

In setting its immediate operating targets, the FOMC necessarily reviews past and prospective relationships between financial conditions and economic objectives. A benchmark in this review is provided several times a year in a presentation by the staff to the Committee of an interrelated set of longer-run economic and financial projections. These exercises review in detail recent economic and financial developments, assess the outlook for and impact of fiscal policy, and trace the likely patterns of change in such measures as income, output, employment, prices, and the balance of payments for a period of about a year ahead. Provisional estimates are also presented of the flow of funds—including various monetary aggregates—and interest rates expected to be consistent with these patterns of economic development. A reappraisal of current tendencies in and prospects for economic activity, financial flows and credit market conditions and the balance of payments is presented to the FOMC by the staff on the occasion

of each meeting. Included in the regular documentation is an analysis of relationships among money market variables, paths for monetary aggregates, and interest rates broadly considered for a period several months ahead.

At each FOMC meeting, most of the time is given over to a free interchange of views by Committee members of their assessment of the current economic situation and outlook and of the related appropriate monetary policies. As the discussion proceeds, each Committee member indicates his assessment of the basic tendencies in economic activity, prices, employment and so forth; his appraisal of recent financial developments in relation to desired economic goals; and what steps might be taken through open market operations (or other policy instruments that interact with open market operations) to help achieve financial conditions suitable to economic goals.

It may develop, for instance, that most of all Committee members believe that economic prospects are deviating from those that had previously been expected and desired. If so, the Committee may wish to modify its objectives concerning money market conditions and desired rates of expansion in monetary and credit aggregates, so as to promote over-all financial and credit conditions that are more conducive to desired economic conditions. Or it may turn out that economic activity is developing about in line with expectations but seems to be entailing a pattern of financial flows different from that originally expected. Still another possibility is that the relationship that is developing between the variables specified for the System Account Manager for purposes of guiding day-to-day open market operations and broader financial flows and interest rates is not what was expected. Under any of such circumstances, the FOMC could react by changing its operating instructions.

The operating instructions in the second paragraph of the directive are expressed qualitatively. But the specific variables involved—money market conditions and monetary and credit aggregates—are typically indicated in terms of ranges in the discussion.

Over the past year the operating instructions embodying the Committee's policy thrust have changed in two general ways. First, as has been noted, somewhat more emphasis has been placed on monetary aggregates as a target for open market operations rather than as an outgrowth of such operations. Second, the time horizon for a path of monetary and credit aggregates (in relation to money market conditions and other financial variables) has been viewed as encompassing several months or, expressed in calendar quarters, at least one or two quarters ahead. Longer-run paths provide the Committee with a means for focusing on the emerging trend of growth in the money supply or in bank credit, while recognizing that, over very short-run periods of a week or a month or so, there may be irregular movements in rates of change in monetary aggregates because of erratic shifts in the public's demand for deposits and such factors as Treasury financings, a large change in U.S. Government deposits, or movements of funds between the U.S. and foreign countries.

ROLE OF MONETARY AGGREGATES

The somewhat greater use of monetary aggregates in the formulation and conduct of open market policy during the past year represents for the most part an extension of the trend of policy over the previous several years. It has always been recognized that monetary policy achieves its effects through its influence on bank credit, money supply, interest rates, and financial flows generally. But the benefits that might be expected from an increased degree of emphasis on monetary aggregates in the conduct of open market operations relate to the question of monetary control under conditions of uncertainty.

Greater emphasis on aggregates is consistent with a variety of economic theories, and it does not necessarily imply any particular judgment as to the importance for the economy of monetary flows relative to interest rates and credit conditions or relative to other influences such as fiscal policy and technological innovation. Operationally, however, by placing more emphasis on monetary aggregates in the instructions to the Account Manager, the FOMC has a greater assurance that unexpected and undesired shortfalls or excesses in the demands for goods and services in the economy, and hence in the demands for credit and money, will not lead more or less automatically to too little or too much expansion in bank reserves, bank credit, and money.

Giving more weight to monetary aggregates means, for example, that if there were an unexpected and undesired short-fall in business and consumer demand for goods and services, the Federal Reserve would continue to provide reserves to

try to keep growth in money and bank credit from weakening unduly at a time when the public, with transactions demand for cash reduced, was seeking to invest excess funds in various financial assets. In the process, there would be a greater short-run decline in interest rates than would otherwise be the case. The drop in interest rates and the easing of credit conditions would help to provide financial incentives that would encourage a strengthening of demands for goods and services.

While increasing the emphasis on monetary and credit aggregates tends to increase the protection against undesired shifts in demands for goods and services, it at the same time runs the risk of reducing protection against unexpected shifts in the public's demand for cash and liquidity. Thus, for example, if the public decides to hold more liquidity relative to income than had been earlier assumed, failure to permit a faster rise in the money supply to accommodate this desire would lead to higher interest rates and tighter credit conditions as the public seeks to sell other assets to acquire cash. The tightening of credit conditions would tend to lead to a weaker GNP than desired. In contrast, the tendency toward tighter conditions could be averted if the Federal Reserve helped to meet the desire for greater liquidity by increasing its purchases of financial assets (through open market acquisitions of U.S. Government securities)—thereby providing more bank reserves to support an increase in bank deposits and in the money supply and to keep interest rates from rising.

In practice, allowance has to be made for uncertainties about both the demand for goods and services and the demand for money and liquidity. Opinions differ among professional economists as to the relative degrees of stability of these types of demand, and practical experience over the past several years suggests that there is a good deal of variation in both. There have been periods when large increases in Federal Government purchases of goods and services and/or in private sector demands for capital goods and inventories have caused marked shifts in over-all demands for goods and services at given interest rates. But there have also been periods when liquidity strains, greatly increased financial transactions, and various international uncertainties have resulted in a sizable upward shift in the demand for cash and closely related assets at given interest rates. Furthermore, open market policy not only needs to distinguish between, and take account of, shifts in both the demand for goods and services and the demand for money and liquidity at given interest rates, but also must evaluate the extent to which such shifts are transitory or more permanent.

The late spring and the summer of 1970 are an example of a period when liquidity strains in the economy—typified by rising long-term interest rates at a time when economic activity was sluggish, by the bankruptcy of a major railroad, and by a generally cautionary attitude on the part of investors toward securities, particularly commercial paper—were giving rise to considerable uncertainty and were threatening a marked erosion in confidence. Under those circumstances Federal Reserve policy stressed the need to moderate pressures on financial markets and to accommodate liquidity needs.

In late June the Board of Governors suspended maximum ceiling rates on large CD's maturing in 30- to 89-days as part of the effort to relieve the economy. This action made it possible for banks to compete for funds and to accommodate borrowers who were not able, in the conditions of the time, to refinance their borrowings in the commercial paper market, or were not able to do so without a bank loan commitment as back-up. And open market operations during the period were conducted in such a way as to provide the reserves to sustain the very large increase in bank credit resulting from renewed ability of banks to obtain funds through issuance of certain large CD's. The FOMC's policy directives in that period (see directives in May 26 and July 21, 1970, on pp. 99 and 100) tended to subordinate, temporarily, longer-run objectives for monetary aggregates to the shorter-run liquidity needs of the economy.

In general, in evaluating the appropriateness of particular operating guidelines at a particular time, the FOMC has to make judgments about the nature of the fundamental influences that are affecting the domestic economy and the international position of the dollar. If, for example, it developed that interest rates were higher, and over-all credit conditions tighter, than expected for a given rate of increase in bank credit or money, the FOMC would have to make a judgment as to whether GNP was stronger than anticipated, whether inflationary expectations were affecting interest rates, or whether the demands for money and closely related assets had shifted at given levels of income and interest rates. Or, as another example, interest rate movements might be undesirably affecting capital flows between the United States and foreign countries; in this case judgments might

have to be made as to how the various policy instruments could be adapted to such a development.

Judgments made with respect to interrelationships among policy objectives would affect not only the open market policy instrument but also other monetary policy instruments. With respect to open market policy, types of adjustments called for in operating instructions would include, for instance, whether to change the targets for aggregates and/or whether to put more stress on money or credit market conditions. Or adjustments might be called for in other policy instruments—such as the discount rate or reserve requirements, including provisions such as those recently made affecting Euro-dollar borrowings of U.S. banks—in order to achieve a variety of policy objectives more effectively.

In looking toward a desired longer-run growth rate in monetary aggregates, the FOMC has focused on money and bank credit in its operating instructions. The concept of money used for these purposes has generally been the so-called narrowly defined money supply—currency in circulation outside the banking system plus demand deposits other than U.S. Government and domestic interbank deposits—but broader definitions have also been taken into account. The determination of what rates of growth may be desired for money takes into account not only what is happening in credit markets but also the rates of growth in certain types of assets held by the public that are closely related to narrowly defined money and that the public holds as a store of value and as a source of immediate liquidity.

A number of broader concepts of the money supply and of liquidity have been utilized by economic analysts in relating money supply to economic activity. These include, in addition to the narrowly defined money supply, a concept—here termed M_2 —that adds time and savings deposits other than large CD's at commercial banks to narrowly defined money; and a concept, termed M_3 , that adds deposits at both mutual savings banks and savings and loan associations. And even these concepts can be broadened by adding other money-like assets, such as large marketable negotiable CD's issued by banks and other short-term marketable securities. Annual, quarterly, and monthly rates of change over the past year in the three concepts of money noted above are shown in the table below.

VARIOUS MEASURES OF MONEY: RATES OF CHANGE

[Seasonally adjusted annual rates, in percent]

Period	M_1 (Currency plus demand deposits*)	M_2 (M_1 plus coml. bank time deposits other than large CD's)	M_3 (M_2 plus deposits at S & L's and mutual savings banks)
1969.....	3.1	2.4	2.8
1970.....	5.4	8.2	7.9
1970—Q1.....	5.9	3.4	2.6
Q2.....	5.8	8.4	7.9
Q3.....	6.1	11.0	10.5
Q4.....	3.4	9.2	9.7
1970—January.....	9.4	2.2	1.2
February.....	-4.1	-1.5	-1.2
March.....	12.3	9.6	7.8
April.....	9.9	10.8	9.7
May.....	5.2	7.6	7.2
June.....	2.3	6.7	6.6
July.....	5.7	9.9	9.9
August.....	6.8	12.5	11.4
September.....	5.7	10.3	10.0
October.....	1.1	7.3	8.1
November.....	2.8	7.0	8.1
December.....	6.2	13.0	12.6

*Demand deposits other than interbank and U.S. Government.

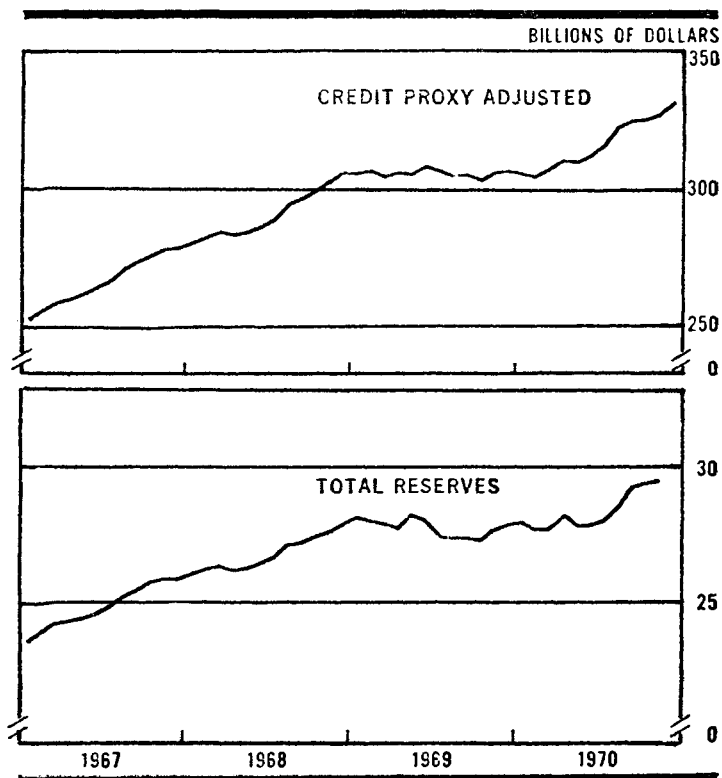
Note: Monthly rates of change based on the daily-average levels outstanding. Quarterly and annual rates of changes measured from daily-average levels outstanding in end-of-period months.

As may be seen, the rates of change for the various measures may diverge noticeably, and they may show a high degree of fluctuation over the short run. Differential tendencies in the various measures of money and liquidity have been the result in large part of sharp shifts of funds by the public between deposits and market securities when market interest rates moved above and then back below

ceiling rates on deposits at banks and thrift institutions. But divergent movements, particularly in the short run, may develop even when ceiling rates are not a disturbing element. This highlights the need to evaluate a variety of money and liquidity measures, among other things in gauging the impact of monetary policy on the economy. Moreover, the relatively large month-to-month variations in growth for any particular money measure—and variations are even larger from week to week—emphasize the need to evaluate data over some long period of time in judging the underlying tendency of the series.

As noted earlier, in addition to the money supply, the second paragraph of the directive has emphasized bank credit. A current measure of bank credit for the guidance of the Account Manager was provided by measuring bank credit from the liability side, since liability data are available more quickly and can be used to construct a series on a daily-average basis. This daily-average measure does not encompass all bank liabilities (it excludes non-member bank deposits and bank capital, for example) but it includes the most volatile ones. It encompasses not only the member bank component of deposits included in M_2 above, but also funds obtained by banks through large time CD's, U.S. Government deposits, and interbank deposits and through nondeposit sources such as Euro-dollars and commercial paper issued by bank-related affiliates. The sum of these deposits and nondeposit sources is called the adjusted credit proxy.

CREDIT PROXY ADJUSTED; TOTAL RESERVES



Bank "credit proxy adjusted" is total member bank deposits plus funds provided by Euro-dollar borrowings and bank-related commercial paper. Through the first half of 1969, no data on bank-related commercial paper were available, but amounts outstanding were not thought to be growing significantly in those periods.

Inclusion of bank credit in the directive might be considered as recognition of a broader concept of money, since time and savings deposits at commercial banks are a key source of bank credit. In addition, however, the inclusion recognizes that bank credit is a key component of total credit availability and one that is immediately sensitive to open market operations.

The amount of bank credit that the FOMC is willing to encourage or to countenance depends, like the money supply, on over-all economic and financial conditions. When, for example, banks have been unable for an extended period to increase time and savings deposits because interest rate ceilings on time deposits were unrealistically low relative to market rates, it was to be expected that outstanding bank credit would grow rapidly for a time after ceiling rates again became competitive. This growth would represent mainly a shifting of credit flows from market to banking channels as banks sought to restore their previous competitive position and as the public restructured its financial asset portfolios to reflect the changed yield relationships. Federal Reserve open market operations could provide the reserves necessary to sustain the shift in the public's ability and willingness to hold time deposits relative to other assets. The accompanying chart shows monthly changes in bank credit, as measured by the adjusted credit proxy, along with total bank reserves.

DAY-TO-DAY OPEN MARKET OPERATIONS

The day-to-day operations in the market by the System Account Manager have continued to be guided mainly by money market conditions, in part because the information that is available daily and continuously as to the state of the money market—for example, the Federal funds rate and dealer loan rates—reflects the interaction of the demand for and existing supply of bank reserves and hence provides a basis for making daily decisions as to whether the System should be in the market providing additional or absorbing existing reserves; and if so, by how much and through what means. But the degree to which the Manager seeks to influence money market conditions has been affected by the relationship that is presumed to exist at any given time among money market conditions, reserves, and the monetary aggregates and by the Committee's desires with respect to monetary aggregates and over-all conditions in the credit market.

Changes in money market conditions, of course, may reflect factors other than efforts to influence reserve flows in accordance with longer-run targets for monetary aggregates. Some changes in money market conditions reflect no more than shifts in the distribution of reserves among banks. Others represent the short-run effects of bulges in demand for day-to-day credit at times of Treasury financings or in tax payment periods. Yet others represent unanticipated, virtually random changes in technical factors—such as float or currency in circulation—that supply to or absorb from the market more reserves than was either expected or seemed likely to be sustained. And as in the summer of 1970, open market operations in relation to money market conditions may sometimes reflect primarily a concern with liquidity pressures in the economy.

Although recognizing that money market conditions are subject to a number of influences, the System Account Manager takes into consideration the relationship between money market conditions and the trends in bank credit and money that has prevailed in the recent past and the relationship that is expected to develop in the future in making decisions concerning reserve provision or absorption through open market operations. At the beginning of a statement week, for example, his operations may be aimed at a condition of tightness or ease in the money market roughly similar to that of previous weeks. This would mean that such variables as the Federal funds rate, dealer loan rates, the net reserve position of member banks, and borrowings by member banks from the Federal Reserve would generally tend to fluctuate within the range of recent experience—although there might be special, sometimes unforeseen developments (such as a mail strike) that could cause marked short-run changes in money market conditions.

If and as it becomes evident that monetary aggregates are running above or below the desired path, however, the Account Manager may aim at correspondingly tighter or easier money market conditions. Also, if it should turn out that the apparent new relationship was not long-lasting, the Account Manager would subsequently have to reverse the direction of his operations. Thus, to the extent that monetary aggregates are given more emphasis in the operating paragraph of the directive, money market conditions may be subject to a somewhat greater degree of fluctuation.

While the counterpart of greater sensitivity to monetary aggregates would be a somewhat greater tendency for actual money market conditions to change more frequently than otherwise, sharp short-run shifts in money market conditions are not likely to develop, in part because the FOMC is concerned with the state of money and credit markets as well as with tendencies in monetary aggregates. There are a number of reasons for the continuing role of money market conditions as a day-to-day guide for open market operations.

First, the money market reflects the pressure of demand for liquidity, and the nation's central bank has a unique responsibility for maintenance of orderly conditions in such a market.

Second, there are large and often unpredictable week-to-week and month-to-month swings in the economy's demand for money and bank credit. These demands are often self-correcting, and as a result there is little purpose in permitting the sharp fluctuations in money market conditions, and perhaps in credit markets generally, that would be likely to develop should the flow and ebb of these demands not be accommodated in Federal Reserve operations affecting bank reserves.

Third, because of the key role of the money market in quickly reflecting shifts in the need for and availability of liquid funds, presumably in large part as a result of the interaction of the public's spending decisions and monetary policy, sharp shifts in money market conditions may be interpreted by market participants as a harbinger of relatively permanent changes in credit demand or monetary policy. Investors, businessmen, and consumer may vary their credit outlook, and perhaps their economic outlook too, in response to the money market to the extent that they regard changes in the market as a signal of events to come. This prospect itself counsels caution in undertaking open market operations that lead to large short-run changes in money market conditions until it becomes fairly certain that longer-run tendencies in money supply, bank credit, and over-all credit conditions require such changes.

While there are reasons for emphasis on money market conditions, it should be stressed that money market conditions are only instrumental to the attainment of the main financial objectives of policy—flows of monetary aggregates and over-all credit conditions—that are appropriate to achievement of over-all economic goals. For the Account Manager, the day-to-day operations of the Account and the effect of these operations on the money market are made even more complex because he is aware that the FOMC generally has in mind not only some view concerning the desired longer-run trend in various monetary aggregates but also a view concerning what should be sought in the way of associated credit conditions.

These desires may sometimes turn out to be in conflict; for example, monetary aggregates as a group may be rising more rapidly than desirable while credit conditions may be tightening more than desirable. Meeting one desire by holding back on the provision of reserves in order to restrain growth in bank credit and money would tend, at least temporarily, to thwart the other desire by leading to even more tightening of credit conditions. Under such circumstances, the Account Manager would have to adjust his operations—thereby affecting day-to-day money market conditions—in line with the sense of priority among operating objectives given by the FOMC.

While the whole set of objectives would be reconsidered at the next FOMC meeting, the Account Manager's operations are monitored daily through a morning telephone conference call. This call involves the Trading Desk in New York, senior officials on the staff of the Board of Governors in Washington, and one of the Reserve Bank Presidents (serving in rotation) who is a voting member of the FOMC (other than the President of the Federal Reserve Bank of New York). Individual Board members may also participate in the call from time to time, as may the President of the New York Reserve Bank. In this call the Manager explains his program for the day, and that program, or possible alternative approaches are discussed. As part of this process, not only are current figures on bank reserve positions, money market conditions, and broader credit conditions reported, but also information on the latest deposit and bank credit figures and how these compare with FOMC desires is appraised.

In general, as the FOMC's objectives with respect to monetary aggregates, and also over-all credit conditions, have been given increased stress in the directive to the Account Manager, the timing and extent of the System's day-to-day open market operations have, of course, been altered, with consequent effects on day-to-day money market conditions. At the same time, the Manager still takes account of the emerging tightness or ease in the money market as a factor affecting the timing and extent of day-to-day open market operations. But this emerging tightness or ease is evaluated against trends in money, bank credit, and over-all

credit conditions, which are, and always have been, among the basic financial objectives of monetary policy.

APPENDIX: CURRENT ECONOMIC POLICY DIRECTIVES ISSUED BY THE FOMC

MEETING HELD ON DECEMBER 18, 1969

The information reviewed at this meeting indicates that real economic activity has expanded only moderately in recent quarters and that a further slowing of growth appears to be in process. Prices and costs, however, are continuing to rise at a rapid pace. Most market interest rates have advanced further in recent weeks partly as a result of expectational factors, including concern about the outlook for fiscal policy. Bank credit rose rapidly in November after declining on average in October, while the money supply increased moderately over the 2-month period; in the third quarter, bank credit had declined on balance and the money supply was about unchanged. The net contraction of outstanding large-denomination CD's has slowed markedly since late summer, apparently reflecting mainly an increase in foreign official time deposits. However, flows of consumer-type time and savings funds at banks and nonbank thrift institutions have remained weak, and there is considerable market concern about the potential size of net outflows expected around the year-end. In November the balance of payments deficit on the liquidity basis diminished further and the official settlements balance reverted to surplus, mainly as a result of return flows out of the German mark and renewed borrowing by U.S. banks from their foreign branches. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to the reduction of inflationary pressures, with a view to encouraging sustainable economic growth and attaining reasonable equilibrium in the country's balance of payments.

To implement this policy, System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining the prevailing firm conditions in the money market; provided, however, that operations shall be modified if bank credit appears to be deviating significantly from current projections or if unusual liquidity pressures should develop.

MEETING HELD ON JANUARY 15, 1970

The information reviewed at this meeting suggests that real economic activity leveled off in the fourth quarter of 1969 and that little change is in prospect for the early part of 1970. Prices and costs, however, are continuing to rise at a rapid pace. Most market interest rates have receded from highs reached during December. Bank credit and the money supply increased slightly on average in December and also over the fourth quarter as a whole. Outstanding large-denomination CD's held by domestic depositors have continued to contract in recent months while foreign official time deposits have expanded considerably. Flows of consumer-type and savings funds at banks and nonbank thrift institutions have remained weak, and there apparently were sizable net outflows after year-end interest crediting. U.S. imports and exports have both grown further in recent months but through November the trade balance showed little or no further improvement from the third-quarter level. At the year-end the over-all balance of payments statistics were buoyed by large temporary inflows of U.S. corporate funds. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to the orderly reduction of inflationary pressures, with a view to encouraging sustainable economic growth and attaining reasonable equilibrium in the country's balance of payments.

To implement this policy, while taking account of the forthcoming Treasury refunding, possible bank regulatory changes and the Committee's desire to see a modest growth in money and bank credit, System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining firm conditions in the money market; provided, however, that operations shall be modified if money and bank credit appear to be deviating significantly from current projections.

MEETING HELD ON FEBRUARY 10, 1970

The information reviewed at this meeting suggests that real economic activity, which leveled off in the fourth quarter of 1969, may be weakening further in early 1970. Prices and costs, however, are continuing to rise at a rapid pace.

Long-term market interest rates recently have fluctuated under the competing influences of heavy demands for funds and shifts in investor attitudes regarding the outlook for monetary policy. Bank credit declined in January but the money supply increased substantially on average; both had risen slightly in the fourth quarter. Flows of time and savings funds at banks and nonbank thrift institutions have remained generally weak since year-end, and they apparently have been affected little thus far by the recent increases in maximum rates payable for such funds. The U.S. foreign trade balance improved somewhat in December, as imports fell off. The over-all balance of payments has been in substantial deficit in recent weeks. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to the orderly reduction of inflationary pressures, with a view to encouraging sustainable economic growth and attaining reasonable equilibrium in the country's balance of payments.

To implement this policy, while taking account of the current Treasury re-funding, possible bank regulatory changes and the Committee's desire to see moderate growth in money and bank credit over the months ahead, System open market operations until the next meeting of the Committee shall be conducted with a view to moving gradually toward somewhat less firm conditions in the money market; provided, however, that operations shall be modified promptly to resist any tendency for money and bank credit to deviate significantly from a moderate growth pattern.

MEETING HELD ON MARCH 10, 1970

The information reviewed at this meeting suggests that real economic activity, which leveled off in the fourth quarter of 1969, is weakening further in early 1970. Prices and costs, however, are continuing to rise at a rapid pace. Market interest rates have declined considerably in recent weeks, partly as a result of changing investor attitudes regarding the outlook for economic activity and monetary policy. Both bank credit and the money supply declined on average in February, but both were tending upward in the latter part of the month. Outflows of time and savings funds at banks and nonbank thrift institutions, which had been sizable in January, apparently ceased in February, reflecting advances in rates offered on such funds following the recent increases in regulatory ceilings, together with declines in short-term market interest rates. The U.S. foreign trade surplus narrowed in January and the over-all balance of payments deficit has remained large in recent weeks. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy the Committee desires to see moderate growth in money and bank credit over the months ahead. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining money market conditions consistent with that objective.

MEETING HELD ON APRIL 7, 1970

The information reviewed at this meeting suggests that real economic activity weakened further in early 1970, while prices and costs continued to rise at a rapid pace. Fiscal stimulus, of dimensions that are still uncertain, will strengthen income expansion in the near term. Most long-term interest rates backed up during much of March under the pressure of heavy demands for funds, but then turned down in response to indications of some relaxation of monetary policy and to the reduction in the prime lending rate of banks. Short-term rates declined further on balance in recent weeks, contributing to the ability of banks and other thrift institutions to attract time and savings funds. Both bank credit and the money supply rose on average in March; over the first quarter as a whole bank credit was about unchanged on balance and the money supply increased somewhat. The U.S. foreign trade surplus increased in February, but the over-all balance of payments appears to have been in considerable deficit during the first quarter. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, the Committee desires to see moderate growth in money and bank credit over the months ahead. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining money market conditions consistent with that objective, taking account of the forthcoming Treasury financing.

MEETING HELD ON MAY 5, 1970

The information reviewed at this meeting indicates that real economic activity weakened further in the first quarter of 1970. Growth in personal income, however, is being stimulated in the second quarter by the enlargement of social security benefit payments and the Federal pay raise. Prices and costs generally are continuing to rise at a rapid pace, although some components of major price indexes recently have shown moderating tendencies. Most market interest rates have risen sharply in recent weeks as a result of heavy demands for funds, possible shifts in liquidity preferences, and the disappointment of earlier expectations regarding easing of credit market conditions. Prices of common stocks have declined markedly since early April. Attitudes in financial markets generally are being affected by the expansion of military operations in Southeast Asia and by concern about the success of the Government's anti-inflationary program. Both bank credit and the money supply rose substantially from March to April on average, although during the course of April bank credit leveled off and the money supply receded sharply from the end-of-March bulge. The over-all balance of payments was in considerable deficit during the first quarter. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, the Committee desires to see moderate growth in money and bank credit over the months ahead. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with that objective, taking account of the current Treasury financing; provided, however, that operations shall be modified as needed to moderate excessive pressures in financial markets, should they develop.

MEETING HELD ON MAY 26, 1970

The information reviewed at this meeting indicates that real economic activity declined more than previously estimated in the first quarter of 1970, but little further change is projected in the second quarter. Prices and costs generally are continuing to rise at a rapid pace, although some components of major price indexes recently have shown moderating tendencies. Since early May most long-term interest rates have remained under upward pressure, partly as a result of continued heavy demands for funds and possible shifts in liquidity preferences, and prices of common stocks have declined further. Attitudes in financial markets generally are being affected by the widespread uncertainties arising from recent international and domestic events, including doubts about the success of the Government's anti-inflationary program. Both bank credit and the money supply rose substantially from March to April on average; in May bank credit appears to be changing little while the money supply appears to be expanding rapidly. The over-all balance of payments continued in considerable deficit in April and early May. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, in view of current market uncertainties and liquidity strains, open market operations until the next meeting of the Committee shall be conducted with a view to moderating pressures on financial markets, while, to the extent compatible therewith, maintaining bank reserves and money market conditions consistent with the Committee's longer-run objectives of moderate growth in money and bank credit.

MEETING HELD ON JUNE 23, 1970

The information reviewed at this meeting suggests that real economic activity is changing little in the current quarter after declining appreciably earlier in the year. Prices and costs generally are continuing to rise at a rapid pace, although some components of major price indexes recently have shown moderating tendencies. Since late May market interest rates have shown mixed changes following earlier sharp advances, and prices of common stocks have recovered part of the large decline of preceding weeks. Attitudes in financial markets continue to be affected by uncertainties and conditions remain sensitive, particularly in light of the insolvency of a major railroad. In May bank credit changed little and the money supply rose moderately on average, following substantial increases in both measures in March and April. Inflows of consumer-type time and savings funds at banks and nonbank thrift institutions have been sizable in recent months, but the brief spring upturn in large-denomination CD's outstanding at banks has ceased. The over-all balance of payments was in heavy deficit in April and May. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, in view of persisting market uncertainties and liquidity strains, open market operations until the next meeting of the Committee shall continue to be conducted with a view to moderating pressures on financial markets. To the extent compatible therewith, the bank reserves and money market conditions maintained shall be consistent with the Committee's longer-run objective of moderate growth in money and bank credit, taking account of the Board's regulatory action effective June 24 and some possible consequent shifting of credit flows from market to banking channels.

MEETING HELD ON JULY 21, 1970

The information reviewed at this meeting indicates that real economic activity changed little in the second quarter after declining appreciably earlier in the year. Prices and wage rates generally are continuing to rise at a rapid pace. However, improvements in productivity appear to be slowing the rise in costs, and some major price measures are showing moderating tendencies. Since mid-June long-term interest rates have declined considerably, and prices of common stocks have fluctuated above their recent lows. Although conditions in financial markets have improved in recent weeks uncertainties persist, particularly in the commercial paper market where the volume of outstanding paper has contracted sharply. A large proportion of the funds so freed apparently was rechanneled through the banking system, as suggested by sharp increases in bank loans and in large-denomination CD's of short maturity—for which rate ceilings were suspended in late June. Consequently, in early July bank credit grew rapidly; there was also a sharp increase in the money supply. Over the second quarter as a whole both bank credit and money supply rose moderately. The over-all balance of payments remained in heavy deficit in the second quarter. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, while taking account of persisting market uncertainties, liquidity strains, and the forthcoming Treasury financing, the Committee seeks to promote moderate growth in money and bank credit over the months ahead, allowing for a possible continued shift of credit flows from market to banking channels. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with that objective; provided, however, that operations shall be modified as needed to counter excessive pressures in financial markets should they develop.

MEETING HELD ON AUGUST 18, 1970

The information reviewed at this meeting suggests that real economic activity, which edged up slightly in the second quarter after declining appreciably earlier in the year, may be expanding somewhat further. Prices and wage rates generally are continuing to rise at a rapid pace. However, improvements in productivity appear to be slowing the rise in costs, and some major price measures are showing

moderating tendencies. Credit demands in securities markets have continued heavy, and interest rates have shown mixed changes since mid-July after declining considerably in preceding weeks. Some uncertainties persist in financial markets, particularly in connection with market instruments of less than prime grade. In July the money supply rose moderately on average and bank credit expanded substantially. Banks increased holdings of securities and loans to finance companies, some of which were experiencing difficulty in refinancing maturing commercial paper. Banks sharply expanded their outstanding large-denomination CD's of short maturity, for which rate ceilings had been suspended in late June, and both banks and nonbank thrift institutions experienced large net inflows of consumer-type time and savings funds. The over-all balance of payments remained in heavy deficit in the second quarter, despite a sizable increase in the export surplus. In July the official settlements deficit continued large, but there apparently was a marked shrinkage in the liquidity deficit. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, the Committee seeks to promote some easing of conditions in credit markets and somewhat greater growth in money over the months ahead than occurred in the second quarter, while taking account of possible liquidity problems and allowing bank credit growth to reflect any continued shift of credit flows from market to banking channels. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with that objective, taking account of the effects of other monetary policy actions.

MEETING HELD ON SEPTEMBER 15, 1970

The information reviewed at this meeting suggests that real economic activity which edged up slightly in the second quarter, is expanding somewhat further in the third quarter, led by an upturn in residential construction. Wage rates generally are continuing to rise at a rapid pace, but improvements in productivity appear to be slowing the rise in costs, and some major price measures are rising less rapidly than before. Interest rates declined in the last half of August, but most yields turned up in early September, as credit demands in securities markets have continued heavy; existing yield spreads continue to suggest concern with credit quality. The money supply rose rapidly in the first half of August but moved back down through early September. Bank credit expanded sharply further in August as banks continued to issue large-denomination CD's at a relatively rapid rate, while reducing their reliance on the commercial paper market after the Board of Governors acted to impose reserve requirements on bank funds obtained from that source. The balance of payments deficit on the liquidity basis diminished somewhat in July and August from the very large second-quarter rate, but the deficit on the official settlements basis remained high as banks repaid Euro-dollar liabilities. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, the Committee seeks to promote some easing of conditions in credit markets and moderate growth in money and attendant bank credit expansion over the months ahead. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with that objective.

MEETING HELD ON OCTOBER 20, 1970

The information reviewed at this meeting suggests that real output of goods and services increased slightly further in the third quarter but that employment declined and unemployment continued to rise; activity in the current quarter is being adversely affected by a major strike in the automobile industry. Wage rates generally are continuing to rise at a rapid pace, but improvements in productivity appear to be slowing the increase in costs, and some major price measures are rising less rapidly than before. Most interest rates have declined since mid-September, although yields on corporate and municipal bonds have been sustained, by the continuing heavy demands for funds in capital markets. The money supply

rose slightly on average in September and increased moderately over the third quarter as a whole. Bank credit expanded further in September but at a rate considerably less than the fast pace of the two preceding months. Banks continued to issue large-denomination CD's at a relatively rapid rate and experienced heavy inflows of consumer-type time and savings funds, while making substantial further reductions in their use of nondeposit sources of funds. The balance of payments deficit on the liquidity basis diminished in the third quarter from the very large second-quarter rate, but the deficit on the official settlements basis remained high as banks repaid Euro-dollar liabilities. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, the Committee seeks to promote some easing of conditions in credit markets and moderate growth in money and attendant bank credit expansion over the months ahead. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with those objectives, taking account of the forthcoming Treasury financings.

MEETING HELD ON NOVEMBER 17, 1970

The information reviewed at this meeting suggests that real output of goods and services is changing little in the current quarter and that unemployment has increased. Part but not all of the weakness in over-all activity is attributable to the strike in the automobile industry which apparently is now coming to an end. Wage rates generally are continuing to rise at a rapid pace, but gains in productivity appear to be slowing the increase in unit labor costs. Recent movements in major price measures have been erratic but the general pace of advance in these measures has tended to slow. Most interest rates declined considerably in the past few weeks, and Federal discount rates were reduced by one-quarter of a percentage point in the week of November 9. Demands for funds in capital markets have continued heavy, but business loan demands at banks have weakened. The money supply changed little on average in October for the second consecutive month; bank credit also was about unchanged, following a slowing of growth in September. The balance of payments deficit on the liquidity basis was at a lower rate in the third quarter and in October than the very high second-quarter rate, but the deficit on the official settlements basis remained high as banks repaid Euro-dollar liabilities. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, the Committee seeks to promote some easing of conditions in credit markets and moderate growth in money and attendant bank credit expansion over the months ahead with allowance for temporary shifts in money and credit demands related to the auto strike. System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining bank reserves and money market conditions consistent with those objectives.

MEETING HELD ON DECEMBER 15, 1970

The information reviewed at this meeting suggests that real output of goods and services has declined since the third quarter, largely as a consequence of the recent strike in the automobile industry, and that unemployment has increased. Resumption of higher automobile production is expected to result in a bulge in activity in early 1971. Wage rates generally are continuing to rise at a rapid pace, but gains in productivity appear to be slowing the increase in unit labor costs. Movements in major price measures have been diverse; most recently, wholesale prices have shown little change while consumer prices have advanced substantially. Market interest rates declined considerably further in the past few weeks, and Federal Reserve discount rates were reduced by an additional one-quarter of a percentage point. Demands for funds in capital markets have continued heavy, but business loan demands at banks have been weak. Growth in the money supply was somewhat more rapid on average in November than in October, although it remained below the rate prevailing in the first three quarters of the year. Banks acquired a substantial volume of securities in November, and bank

credit increased moderately after changing little in October. The foreign trade balance in September and October was smaller than in any other 2-month period this year. The over-all balance of payments deficit on the liquidity basis remained in October and November at about its third-quarter rate. The deficit on the official settlements basis was very large as banks continued to repay Euro-dollar liabilities. In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to orderly reduction in the rate of inflation, while encouraging the resumption of sustainable economic growth and the attainment of reasonable equilibrium in the country's balance of payments.

To implement this policy, System open market operations shall be conducted with a view to maintaining the recently attained money market conditions until the next meeting of the Committee, provided that the expected rates of growth in money and bank credit will at least be achieved.

Mr. HANNAFORD. Thank you, Dr. Pierce.

Fortunately, and in the nick of time the chairman has arrived before I had to make any decisions about how to proceed.

Would it be best to proceed by questioning Dr. Pierce, or would you—all right, let's proceed then with Dr. Meltzer's testimony, and you can proceed in whatever manner you would like, Dr Meltzer.

STATEMENT OF DR. ALLAN H. MELTZER, GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION, CARNEGIE-MELLON UNIVERSITY

Dr. MELTZER. Thank you, Mr. Chairman and Mr. Hannaford.

The subcommittee's interest in the problem of maintaining appropriate monetary policy, as evidenced by regular hearings under House Concurrent Resolution 133, is, I believe, one of the most important developments in recent years. It will have an important influence on the way in which we conduct our economic policy.

The rate of increase of consumer prices in the United States has fallen, gradually, from nearly 14 percent in mid-1974 to an average rate of about 6 percent for the past 6 months. Some further reduction in the average rate of inflation is likely to occur in 1976.

Experience in the rest of the world covers a wide range. Some countries substantially reduced the rate of price increase; in others the rate of increase remained high. During the year 1975, consumer prices rose by more than 20 percent in Britain, by approximately 10 percent in France, Italy and Canada, and by 5 percent or less in Germany and Switzerland.

Why are the rates of price increase in these countries so different? Why is inflation no longer proceeding at high or rising rates everywhere? Why have some countries succeeded in reducing inflation where others have failed?

The answer to these questions is surprisingly simple. Government policies toward inflation have differed. Some countries recognized inflation as mainly a monetary phenomenon, the result of too much money in circulation and too high a growth rate of money and took effective action to control inflation. The countries that now have the lowest rates of inflation, Switzerland, Germany, and the United States, are the same countries that changed their approach to monetary control. Each of the countries has, in its own way, chosen a target rate of increase in money. Each has managed to keep the growth rate of money close to the announced target.

Where the rate of growth of money has been reduced, the rate of inflation has been reduced. Where monetary growth has been kept at a high rate, the rate of inflation has remained high or has increased.

Britain is an outstanding example. During the past year most countries experienced less inflation, but Britain experienced more. British consumer prices rose by 16 percent in 1974 and by more than 20 percent in 1975. Even Italy, with its severe political, social and economic problems, was able to slow inflation, to reduce the rate of increase in consumer prices from 1974 to 1975. But Britain did not.

Economists differ about why inflation starts and about how inflation can be reduced and ended. For decades influential British economists argued that it was unnecessary to control the rate of monetary expansion. Some argued that the way to end inflation was to stimulate the economy by Government policies that create jobs and output. By increasing output they hoped to lower prices or the rate of inflation. Contrary to experience everywhere they sought to end inflation by stimulating the economy.

The result was predictable, and both the predictions and the results are part of British history. Inflation increased. An economically weak Britain became weaker as measured by employment and inflation.

Programs similar to those that failed in Britain are advocated and at times adopted here. We followed the British into stop and go policies—policies to stimulate the economy today and take care of the inflation tomorrow. We achieved more inflation and currently have more unemployment. We followed the British and other Europeans in attempting to control inflation by using government intervention in wage and price setting. Inflation did not stop, it increased.

The policies of the past year and the results they achieved are a means of discriminating between the differing opinions about the causes of inflation and the means of ending inflation. Some prominent economists both here as well as in Britain urged rates of monetary expansion in 1975 as high as 16 percent, and a rate of monetary growth of 10 percent in 1976. They argued that with unemployment high, strong stimulus would reduce unemployment and reduce inflation.

If we had adopted very expansive policies, we, like the British, would have experienced rising inflation in 1975 and 1976. Instead of a falling rate of inflation we would now have a rising rate of inflation.

The marked difference in countries' experience with inflation during 1975 and 1976 is not a unique event. Recent experience is only a repeat of the experience of the late forties with a change in the roles chosen by the governments of particular countries. Then, and now the countries that promptly reduced the rate of monetary growth ended inflation promptly. Countries that experimented with controls on prices and wages, with restrictions on credit or that engaged in fine tuning of taxes and government spending continued to experience inflation.

No sustained inflation has ever been ended until the growth rate of money has been reduced. Inflation at the end of World War II, after the Korean war, and in other times and places were ended by controlling money. The experiences of the past 2 years are in this respect consistent with the past.

What of the future? Barring some new shock like the oil price increase, a crop failure, or a war, we can expect the economy to approach full employment in about 2 years if Government policies are

less erratic in the future than in the past. We cannot expect, however, to reach full employment without inflation. In this respect, as in many others, Government promises and performance differ.

Ending inflation means bringing the average rate of price change, properly measured, to zero. We are fighting inflation. Inflation has been reduced, but we will not end inflation unless we change some Government policies and continue others.

I believe we can end inflation in the next few years. To do so, we must adhere to four principles of economic policy.

First, we must continue the present international monetary arrangement known as the fluctuating exchange rate system. The chairman of this subcommittee has been very important in getting that system of fluctuating exchange rates adopted as U.S. policy. Under the fluctuating rate system, we rely on the market and not on governments to determine the current exchange value of our currency. The exchange value of the dollar fluctuates, rising with increases in the demand for dollars and falling when we speed up the printing press and increase the supply of dollars. The fluctuating exchange rate protects us against inflationary or deflationary economic policies abroad. If foreign governments adopt policies more inflationary than ours, and many governments have, the fluctuating dollar helps us to avoid inflation. We are freer to pursue stable prices.

Second, we must reduce the growth rate of Government. A high growth rate of Government transfers spending from private to public hands, and reduces efficiency. Growth of public employment transfers skilled labor from more productive to less productive activities and slows the growth of the economy. Government regulation absorbs skilled personnel in countless wrangles with the bureaucracy, increases uncertainty and deters investment. But the principal effect of a growing public sector on inflation is not from the loss of efficiency and growth. A rising government budget creates strong pressure to finance the Government by printing money. Our current inflation began when we tried to finance war and social programs in the midsixties without raising taxes. Despite a 400 percent increase in the Federal budget, in little more than a decade, costs of social programs continue to increase and the problem of financing the budget without increasing taxes remains a force for inflation.

Third, we must continue to reduce the growth rate of money gradually. Between 1973 and 1976, the rate of monetary growth has been lowered from 9 percent to about 5 percent. This reduction is the most important force working to reduce present and future inflation. During the next 2 or 3 years, the rate of monetary expansion must be brought, gradually, to about 3 percent. Once we fully adjust to the lower rate of growth on money, the economy will be at full employment without inflation.

Fourth, we must avoid price and wage controls and Government interference in price and wage decisions.

If we do these things, we will achieve economic stability with high employment and low inflation that we currently do not have.

Thank you.

Mr. HANNAFORD. Thank you, Dr. Meltzer.

One general question I would like answered would apply to both of you. In your statements you ascribe a cause-effect relationship with

the money supply and various other forces, but primarily with the money supply that does not seem to take into account the 23-month lag that we have discussed in our charts here, and as you describe what we have done in money supply just very recently, Dr. Meltzer, in your last sentence or so, could you comment on that?

It seems to me that lacking precision as to how long an action takes place, puts us all in the dark feeling around and not knowing the cause and effect relationship.

Dr. MELTZER. First, the 23 months, or roughly 2 years, is an average. It does not hold in any particular instant, but it is well researched and I believe has been supported in a general way by the work of many different people. Therefore I think we can use it as a reasonable rule of thumb in trying to think about the effects of monetary policy. We can think about a 2-year average lag between the time we slow down the money growth rate and the time that the rate of inflation slows down.

That means that the lower rate of inflation that we are currently experiencing is mainly the result of slower monetary growth that began sometime in 1974. We are now getting the benefits of the slowing in policy, the very rapid slowing in policy in 1974 that Dr. Pierce talked about in his statement. I believe that slower monetary growth, maintained for the past 2 years, has contributed to the lower rate of inflation. Of course, it also contributed to the recession. We experienced a recession, a severe recession in between.

We are now getting the benefits of the slow growth, having paid most of the costs in the past. It is important to understand that because we have paid those costs, and are now reaping the benefits, that we must continue this policy so as to receive the benefits for which we have already paid.

Mr. HANNAFORD. Your answer then is that your cause-effect relationship does indeed take into account the 2-year lag.

Dr. MELTZER. Indeed.

Mr. HANNAFORD. You know what happened to the Breton Woods amendment last week under suspension. You made comments about the importance of the floating rates of foreign trade and our committee got quite a shock last week on that bill.

Dr. MELTZER. It is quite important, I think, that we continue the floating rate system and that we do not try to substitute the judgment of governmental agencies for the market process determining exchange rates. The main reason is that I don't believe that governments are able to pick exchange rates that will be stable exchange rates. Most of the experience that we have had in the past leads us to believe that if countries pursue different monetary policies and have different rates of inflation, there is no way that they can maintain fixed exchange rates. The only choice that they are going to have will be a choice between whether they want rates to change in large jumps, with great dislocations, or in small, steady movements as they have been doing since the floating exchange rate system has been in effect.

Mr. HANNAFORD. You expressed concern, some disagreement about the various Government full employment programs as a contributor toward inflation. If such programs created production for the marketplace instead of leaf-raking, you wouldn't be concerned about that, would you, if you used the recently experienced program in Germany

to pay a small subsidy for employing people in the private sector, or what have you?

Could you comment on that sort of program?

Dr. MELTZER. I believe that there are important and useful things that Government can do to stimulate employment, but I don't believe that they include either employing people in the public sector in makework jobs or subsidizing the employment in the private sector in the way in which you just described. I believe that there are useful things that can be done, and one of the most useful is to try to get people employed in meaningful jobs within the private sector.

In order to do that, it seems to me that there are some useful things to be done. One of them is that instead of paying a subsidy for training that minimum wage legislation be removed for selected classes of employment, particularly for people who would be trained to do useful work. With training, they would have the prospect of earning higher wages at some time in the future. I think that kind of program—I will be glad to expand on some other—that kind of program is more meaningful and more helpful than either the kind of program envisaged, say, under the Humphrey-Hawkins bill or the kind of program that would require some subsidy for private employment.

It is very difficult to administer the subsidies to private employment that would be required by many bills, and it is particularly difficult to assure that the employees who are being subsidized, the employment that is being subsidized directly by the Government is in fact new creation of employment rather than just simply the moving of people from one job, unsubsidized, to a job that is subsidized, with little net increase in employment.

Mr. HANNAFORD. Early in your statement you said that you thought House Concurrent Resolution 133 was one of the most important acts of recent years. I was pleased to hear that because I didn't have that much faith in it when we did it. If a little bit is good, is more better?

Dr. MELTZER. Well, that depends on what more.

Mr. HANNAFORD. I mean in terms of House Concurrent Resolution 133.

Do you think more exacting demands, congressional demands might be made in terms of monetary policy and perhaps coordination of the two, or do you think we are about where we should be in terms of congressional interference with Fed policy?

Dr. MELTZER. I believe that we should not make exacting demands that set up anticipations that we can deliver things that we, that is, we economists are unable to deliver. If we set very precise targets for what we want to achieve, I don't think that we have the ability now or in the near term future to deliver.

On the other hand, I think the Congress could be more exacting in its demands on the Federal Reserve. Among the things that it could do would be to get greater precision in statements describing what the Federal Reserve is trying to achieve. I agree with the general thrust of Dr. Pierce's statement. It would be useful if the Federal Reserve announced what it was trying to achieve and over what horizon it was trying to achieve its goals, without being committed, necessarily, to those goals. An announcement of what it is that the Government is aiming at, what its policy seeks to achieve, and what kinds of

programs it had adopted in order to achieve those ends, those would be steps in the right direction. It would give information to people without giving the impression that targets have been chosen that necessarily must be achieved for the survival of the agency.

Mr. HANNAFORD. Mr. Neal, do you have some questions?

Mr. NEAL. I would like to pursue the point you made a moment ago about other programs that you might have in mind for reducing unemployment in noninflationary ways. How, in fact, can this be done? It is certainly highly unlikely that the minimum wage laws would be rescinded.

Dr. MELTZER. I would like to relax them to exclude some people, particularly—we have an enormous problem of young unemployment. When we look at the unemployment statistics, they are not an undifferentiated mass. There is a large group of people who are being kept from gainful employment, in my opinion, because they have no skill and there is no mechanism presently available to get them trained in the kind of skills that would permit them to lead useful lives and do productive labor.

Mr. NEAL. Well, if employers would substitute unskilled young workers to whom they could pay reduced wages, wouldn't many older, skilled workers—breadwinners, heads of households—be out of work?

Dr. MELTZER. There is, of course, some tendency for that to occur. I don't believe that the offset would be one to one. There would be some incentive on the part of companies to take advantage of the opportunity to hire people at lower wages and train them to do skilled jobs that need to be done, and that are not now being done.

One observes in foreign countries when imported labor enters they do jobs that local citizens often do not do. The same kind of situation exists here. The choice is either to hire a foreign worker or not have the job done. Labor in the domestic economy is not available at wage rates that would permit the job to be done profitably.

Mr. NEAL. Would that be your No. 1 priority?

Dr. MELTZER. That would be one of my—I don't know that I want to assign a priority. I would like to see considerably more done to try to stimulate employment in the private sector than is currently being done, but in a noninflationary way.

Mr. NEAL. Like what?

Dr. MELTZER. The second step—I'm sorry.

Mr. NEAL. What do you have in mind?

Dr. MELTZER. Well, I would believe that it would be salutary to reduce the size of the public sector and reduce taxes, to reduce the total size of the budget and taxes, and that I believe that would have a stimulating effect on employment in the private sector.

Mr. NEAL. What programs would you do away with? Where would you make this cut?

Dr. MELTZER. Specific programs I would do away with in the public sector?

Mr. NEAL. Right.

Dr. MELTZER. I believe that there are two ways in which we can reduce total costs of Government. One is that many of the programs that we have are programs that employ large numbers of people without accomplishing any specific end. I will begin to detail some of the programs and some of the areas.

Mr. NEAL. Well, I would be very interested in that.

Dr. MELTZER. All right.

I think that in the regulation of housing and in the regulation of construction there are a number of laws that require enforcement, that are enforced, and that are supervised, that in fact have deleterious effects on employment in this country. For example, Davis-Bacon is an important law. Now, you may say it is politically impossible to remove Davis-Bacon. Nevertheless, Davis-Bacon has a negative effect on construction in the private sector. So if we would remove that law and remove the people who are responsible for enforcing that law, we would reduce public employment and at the same time we would remove a regulation that prevents people from building more buildings at lower prices. That would be a step in the right direction.

There are a whole series of such laws, for example, the Jones Act, which restricts interstate commerce to carrying cargo in American bottoms. It raises the cost of carrying cargo.

There are a series of such laws.

Mr. NEAL. Well, excuse me. Even though I personally don't think Davis-Bacon is a very good idea, it is not the kind of program employing large numbers of Federal workers, which I thought you had in mind.

Dr. MELTZER. Well, we could take OSHA, where there is a large number of public employees. One of the main reasons for that large number of public employees is because the Congress has been unwilling to make clear and definite rules regulating the practices that it seeks to regulate. Consequently OSHA has put into the field a large number of employees who are subject to very little direct control by the Congress and who are making rules and enforcing rules differently in different districts and without very much control.

That has three effects. One, it creates employment in the Federal sector; two, it deters private activity by diverting attention within the private sector toward the administration of a series of rules; and three, it creates uncertainty about what the consequences of particular kinds of activities are. There are large numbers of programs, particularly in recent years, that have passed in recent years, that have similar effects on employment.

Now, I am trying very carefully to separate the public purpose that Congress may wish to achieve from the way in which that purpose is achieved.

Mr. NEAL. How could the Congress attempt to achieve the statutory objectives in the area of occupational safety and health, for instance, without having regulators in the field?

Dr. MELTZER. It could outlaw certain kinds of practices. That would be one way. It could require insurance type arrangements. Certain kinds of activities that contributed, that were known to contribute, a considerable amount to lack of safety would be insured, perhaps at high cost, by those people who engage in the practices. That would diversify the responsibility for those activities and reduce the cost of administration and reduce the arbitrariness of the ways in which those decisions are made. We could try to base the costs of insurance on the historic frequencies with which the accidents have occurred, and charge insurance premiums. Those insurance premiums would be a deterrent to the type of activity that people

may now engage in and that Congress may wish to prevent. I believe that would be a cheaper way of doing it; it would leave much more to private decisionmaking, and it would tend to reduce uncertainty.

Mr. NEAL. You would have private insurers increase the rates for certain types of businesses; is that what you are saying?

Dr. MELTZER. Congress would require that people who produce certain kinds of high risk where safety was involved, must carry insurance; that's right.

Mr. NEAL. Must carry health insurance?

Dr. MELTZER. Either insure or not engage in activities.

Mr. NEAL. Or life insurance, in some cases, of some type, and then naturally you would say the Government shouldn't set the rate because it should be set by private industry.

Dr. MELTZER. It should be done in the private market.

Mr. NEAL. I will move briefly to another subject. Public debate centers around fiscal policy as the main culprit in creating inflation, but our preliminary findings indicate that monetary policy is probably more to blame for inflation than fiscal policy. I did not hear everyone's comments on this issue except for Dr. Meltzer's comment that the Fed increases the money supply because of the pressures exerted on it by the actions of Congress, but—

Dr. MELTZER. Congress and the administration.

Mr. NEAL. Or of Government, right.

But you wouldn't say that the Fed necessarily had to respond as it did.

Dr. MELTZER. No; it did not.

Mr. NEAL. However, officials of the Fed and members of the business community back home who write me about the subject say that the Fed had to respond to what the Congress and the administration want.

Dr. MELTZER. The Fed has a choice.

Mr. NEAL. Dr. Pierce?

Dr. PIERCE. I think the record is clear enough that the Fed on average has behaved in that way. It seems to me the important point is that because the Fed makes no pronouncement to the effect that it will accommodate fiscal policy, and often makes pronouncements to the contrary—that it is the institution that will fight inflation and work against the profligate spending of either the administration or Congress or both—but in fact ends up financing the deficits, that there is a tendency to underestimate the inflationary impact of the fiscal programs because in fact you are having two policies working in locked step. You are having both a fiscal and a monetary effect and I think that was part of the problem in the 1960's. There was a lot of debate about fiscal policy, a lot of talk on the part of the Federal Reserve about fighting the possible inflation that would come from it, but in fact it was not, with a couple of spasms, such as 1966. There was, therefore, a tendency to understate the inflationary impact that the Government was having on the economy.

That was particularly important in light of the fact that there are long lags between inflationary policies, either fiscal or monetary, and the inflation itself. So it looked like this was a free thing to do at the time. Prices weren't rising very rapidly. We could finance the war and the social programs and not raise taxes and not even have

interest rates rising very much. It looked like the best of all possible worlds, and then we pay the price for it later.

And it seems to me the important thing is to be aware of the lags, and second, to be aware of the importance of policing both monetary and fiscal policy.

Mr. HANNAFORD. Would you yield?

Mr. NEAL. Yes.

Mr. HANNAFORD. We have talked about the lags and we have talked in general terms about a 2-year lag in monetary policy and its effect.

What kind of a lag are we talking about in fiscal policy? It is somewhat short, isn't it, it is much shorter, isn't it, almost immediate?

Dr. PIERCE. No; the way I tend to view these things is I look at inflation being generated by the effect that say a policy has on the behavior of demand in the economy relative to the available supply. Fiscal policy would only have a shorter lag than monetary policy if somehow its effects on demand and the economy are more rapidly than for monetary policy. There is a little bit of evidence on that, but not a great deal.

Fiscal policy may be a little bit more rapid, but I don't really think that is an important issue. I think the important thing is it takes time to get going and that the effects are distributed over time. One place where I would be at issue with some of the work that is being done is that the effect of policy depends on where you are and how long the policy is sustained. But I don't think that anyone has demonstrated to any believable degree that if one puts money in today, out plops prices 27 months from now. The relationship that is being looked at is an average. It depends on the circumstances in the economy and how long that policy is pursued.

The crucial issue, it seems to me, for basic policymaking is whether these policies are pursued for sustained periods of time. If they are, then their effects will be felt, I believe, on the rate of inflation in the economy.

Mr. HANNAFORD. The Congress enacted a tax stimulus last year, earlier in the year, which the President signed with one hand while he held his nose with the other.

Dr. PIERCE. Right.

Mr. HANNAFORD. Subsequently we had an improvement in the employment, in the general economic climate, and that was a very shortrun situation, thereafter both Congress and the President claiming credit for it.

Dr. PIERCE. Right.

Mr. HANNAFORD. What you are saying is that we have a 2-year lag in both monetary and fiscal policy, more or less.

Dr. PIERCE. With respect to prices, not demand for output and employment. That lag is much shorter. That is why the reading of the situation can be deceptive. It looks like you can get a lot of employment with no inflation in the short run. The inflation will come later.

Mr. HANNAFORD. All right, I see.

I was afraid that any good work that I did would accrue to the benefit of my successor.

Dr. PIERCE. That almost always is the case, but that is life.

Mr. NEAL. Dr. Meltzer, you said in your comments that you think that the Federal Government has been too stimulative recently, did you not say that?

Dr. MELTZER. No; I did not. I would like to see the Federal Government gradually reduce the rate of growth in the money stock and of course, the size of the budget deficit, and I would add, the level of expenditure and tax rates, or at least the growth rate of the budget.

To talk to the monetary policy first, I said that I thought that the policy has, on average, been stabilizing. The growth of the money stock has come down from 9 percent to approximately 5 percent. I think that over the next few years we have to bring it down even more if we are going to be rid of inflation. That is a goal that I think we want to achieve. We would have to bring the rate of the growth of money down from approximately 5 percent at present to about 2 to 3 percent over the next several years, but I would like to see that done gradually.

While I refer to the current reduction as gradual, we ought to mention the fact that it is highly erratic as well. I would like to see it much less erratic than it has been, but the average movement has been one that seems to me to be appropriate.

Mr. NEAL. Do you think that fiscal policy has been conducted appropriately, and that if we stay on the course that we are on, that that is responsible?

Dr. MELTZER. I favor the stimulus that the economy received from the tax reductions in early 1975, and the continuation of those reductions. I would like to see larger tax reductions accompanied by reductions in the growth rate of Government expenditure.

Dr. PIERCE. May I respond to that?

Dr. Meltzer and I may agree that the Government should be smaller, or we may disagree, but it seems to me that has nothing to do particularly with controlling inflation. Inflation has to do with the economic policies in general that the Government is pursuing, and we could half the size of the Federal sector and still have monetary policy generate tremendous inflation today.

I think it is productive to try to separate those two issues. I don't think the cause of inflation in this country is Davis-Bacon or the minimum wage. Those factors may introduce inefficiencies into the economy and lead to a lower standard of living than we might otherwise have, assuming we can agree on how to measure standard of living. If we always measure the standard of living by the output of the private sector, which so many people are inclined to do, mistakenly, I believe, then those factors affect the standard of living, not the inflation rate.

Imposing restrictions on private firms restricting competition on the economy affect the potential for output of the economy. They don't have any obvious effect on the rate of inflation in the economy. And I think one would be misguided to say well, the way to really solve the inflation in this country is to get rid of the minimum wage, throw out the labor unions and stop all Federal regulations.

I think there is a tendency on some people's part—and I am not accusing Dr. Meltzer of this, but one sees it elsewhere—these measures would get inflation under control, and I think that is wrong. I think the way to get it under control is with joint economic policies, and if

one doesn't like the mix between the public and private sectors of the economy, fine, change those. But those should be separate decisions that are viewed in the context of their effects on the society.

Dr. MELTZER. We entirely agree. In fact, I have been careful to keep the issues separate. I don't think that one wants to forget them for that reason. There are questions of efficiency. Whether we add 0.1 of 1 percent to the growth rate, or one-quarter of 1 percent per year, makes a substantial difference to the lives of individuals. The effect accumulates over time. We can live in a society with zero inflation and very low, slowly increasing standards of living, or we can live in a society with zero inflation and rapidly increasing standards of living. It is that question we have to address at some point.

The question is how efficiently and for what purposes we use resources? That is a very important question, and it is very much involved with the subject matter that this subcommittee either is or should be interested in, and I believe that the members are interested in.

Dr. PIERCE. Let me finish this little bit.

I agree with Dr. Meltzer, except I don't draw any necessary relationship between the output of goods and services in the economy as measured by the GNP and the standard of living. If a society wants to spend more of its time in leisure, if it wants to spend more of its time on education, that is its business, and that is a social decision, and I don't think that one wants to draw the inference because an economy is growing in terms of the GNP accounts, that somehow it is inefficient and wrong.

Dr. MELTZER. No, no, we are not talking about that question. We are talking about the inefficiencies built in by regulation. I am trying to be careful to say that if Congress wants regulations, that is a separate issue that we ought to discuss separately. A separate issue is whether we provide the regulations or rules in such a way as to permit the maximum efficiency under that set of rules. I am arguing that the way that we go about regulating encourages inefficiencies. We can separately decide whether we have good rules or bad rules. Those are judgments that I believe Congress has to make.

Mr. NEAL. The subcommittee staff has conducted research on the growth of money supply and preliminary results show that money supply changes are responsible for 60 percent of inflation. What do you say?

Dr. MELTZER. I would say more than 60 percent.

Mr. NEAL. But something in that neighborhood is right, and you can account for the other 40 percent, say, with things like Federal deficits, the aftermath of wage and price controls, the dollar devaluation, oil prices, and food prices, administered prices and the power of labor unions and all of these other things that you can talk about.

Is that an accurate or essentially accurate description of the situation?

Dr. PIERCE. That is a hard question to answer. Because monetary and fiscal policies in this country move together, we really have no way of separating with any degree of accuracy who the culprit is. If every time that the administration or the Congress goes on a spending spree the Fed prints money to finance that, then it is really a matter of taste as to whether you lay the blame on Congress or the Fed. If the

initiating influence is the Congress and the administration, then I should think that we would have to blame most of the inflation on them because all the Fed has done has been the good stepchild and gone along.

And so much of the arguments are in terms of economists' controlled experiments. They say, well, what if money hadn't grown so rapidly, yet fiscal policy had continued.

Now, to the best that we can estimate, that would truly influence the rate of inflation, but if it never happens, the question is moot.

Mr. NEAL. Well, excuse me. It seems to me we do have the opportunity now, if Dr. Meltzer is correct, to move in the right direction because we have suffered the consequences, or a majority of the consequences of our previous mistakes.

Dr. PIERCE. Oh, I agree, indeed, and I would put a higher number on the role of the Government policy than the 60 percent that you do. I think there were some shortrun shocks, particularly OPEC, that were unavoidable, but the basic inflation rate in this country has been determined by the policies of the U.S. Government. They have not been caused by shocks. A lot of them are hard to read: the effect of the commodity boom. I think a reasonable person could argue that the United States was not exactly blame-free in causing that commodity boom as an exporter of inflation.

I put the rate very high. I don't know if I would put all the blame on monetary policy, but on Government policies in general.

Dr. MELTZER. I would like to go back to that question, Mr. Neal, because first I would put the percentage higher than 60 percent on monetary policy. I would like to say a few words about the kinds of evidence that will help us to find an answer. We don't have to look solely at our own experience. We have a country like Brazil that has gone from 80-percent inflation down to something like 10 or 15 percent and back up to 60 or 70 percent. During the period that it went from 10 or 15 up to 60 percent, the government budget has been balanced almost all the time. The inflation has been entirely produced by giving credit to the private sector.

We can look back at our own experience. We have experience with inflation when the public sector was extremely small. Central banks are able to produce high inflation without a budget deficit.

Take the great German inflation of the 1920's. The public sector in Germany was larger than the public sector in the United States at the time, but by no means large by any of the standards we would use today. Much of that inflation was produced by giving credit to the private sector.

I can cite other examples. We have inflation where the Government budget is financed by printing money. We have inflation where the private sector is financed by printing money, and we have the experience repeated over and over again for as long as we have had experience with money.

So it seems to me that we have a preponderant weight of evidence which says that it doesn't really make very much difference—and I want to emphasize, it doesn't make very much difference who is being financed in the first round of spending. What is important is the rate at which that financing occurs.

Dr. PIERCE. The difference is more apparent, I think, than real. I think that in the postwar period in the United States that there has been a very close coincidence between monetary and fiscal policies. That is not to say they had to be the same, they could have been quite different. Had they been different, the results in the economy would have been different. It is perfectly possible for monetary policy to offset fiscal policy. It is perfectly possible for the two policies to go their own way or to move together.

Mr. NEAL. Well, let me interrupt you gentlemen.

It has always troubled me, and it seems to me this has occurred, I think it happened in 1974—the Fed said that the reason for the inflation we are experiencing is the level of deficits, and their answer was to cut off the supply of money, slow it sharply enough to promote recession.

Now, that was not a reasonable response, it doesn't seem to me. Nor is it reasonable to finance deficits by excessive money growth. There is a middle ground I believe.

Dr. PIERCE. There is a human tendency I think to say that you are to blame for the mistakes and we are going to correct them. The deficits which they were talking about, which were important deficits in my opinion, were the ones that occurred in the late 1960's, when policy in this country was extremely expansionary, and there were some later effects in 1972 for example, both fiscal and monetary policies. Those deficits, particularly in the 1960's, were inflationary.

Now, the current deficit—

Mr. NEAL. Well, excuse me. If monetary policy had been different at that time—

Dr. PIERCE. Then the effects would have been different, indeed.

Mr. NEAL. The effects would have been—

Dr. PIERCE. In Dr. Meltzer's terms, if the Fed had not allowed the money supply to grow more than 3 percent a year during the late 1960's, the effect on the economy would have been far, far different.

Dr. MELTZER. We can say what that effect would have been. There would have been far less inflation.

Mr. NEAL. But to return to the 1970's, would we have had a recession with 3 percent money growth?

Dr. PIERCE. I think we would have had some recession from OPEC. That is unavoidable. The degree of it was exacerbated by the policy reaction to the shocks that occurred from the outside, and from the distortions that we had built into the economy, wage-price controls, higher demand, and so on and so forth. The recession was probably unavoidable given the background, but the background was influenced so strongly by governmental policies.

So I basically believe that the economy is really a very stable animal except for the Government, and it is the Government that imparts a great deal of instability to it. And that is why I would put less emphasis on the Fed underwriting a private boom in the economy than a Government-induced boom. The private booms are hard to find, except maybe railroads. The booms seemed to come from the Government itself, and then feeding on it.

Dr. MELTZER. We entirely agree on that. We agree that in U.S. history, the Government is the main source of instability. We have a lot of evidence from other countries as well that shows that the

Government can produce inflation by financing a private boom, and of course, they have. There are examples from the past and in the case of Brazil at present, where the budget is in balance yet the inflation rate has gone up to 60 or 70 percent.

Dr. PIERCE. But with the current deficit, while very large, the great bulk of that deficit is caused from the still depressed economy and depressed tax revenues, not from any positive Government action on the part of expenditures or taxes. There was a tax cut, but it was a pretty small tax cut, given the size of the economy. It had an effect, but it certainly couldn't turn things around when you are having a \$20 billion tax cut and a \$1 trillion economy. It was in the right direction, but small. The bulk of the current deficit is simply depressed revenues. There is some fiscal stimulus right now, but not very large.

Dr. MELTZER. May I take a slightly different tact on that question and see if it is responsive to your question?

Recently, on average, the Fed has taken about 17 to 20 percent of the deficit and financed it. If it did that this past year, we would have a much more rapid rate of growth in the money stock, and Dr. Pierce and I would both agree that we would currently experience both, more stimulus in the economy than we currently enjoy, and we would be running into the problem of rising prices.

Now, we may differ about whether the rising prices would have occurred 2 months ago or 6 months ago or whether they will occur 6 months from now. The precise timing around the 24-month, 2-year average, we might differ about that in the particular instance. But we would not differ, as far as I can tell, about what the effect would be. We would run into a problem of inflation.

We would then have to face the problem of how we get out of that period of rising prices, or try to prevent its full effect. We would have to slow down the growth rate of the money stock. Slowing down the growth rate of the money stock would almost certainly mean that we would reduce the stimulus in the economy. That would produce a contractionary effect 6 months or 8 months later for the same reason that we forced a contraction in 1974 when we slowed the money growth rate suddenly.

Dr. PIERCE. Well, perhaps Dr. Meltzer is inferring more agreement to me than he should.

I don't think that if we had a somewhat more expansive monetary policy that the effect on inflation would have been very large, provided that policy were cut back as we came closer to fully employed resources. But we do have some general information that if you have sustained, rapid money growth, you can expect some inflation eventually, and probably it doesn't take all that long. It could be a matter of a couple of years.

That, I think, is sufficient to keep the performance of monetary policy within relatively narrow bounds, and I would hope would lead, for both monetary and fiscal policy, to much more stable policies. If we could give stability to economic policies in this country, a lot of our problems would go away. The Government is continually reacting to the mistakes of the past and overreacting to them, and I thought for a while we were running the danger of having explosive policies. The errors get bigger and bigger and the responses get bigger and bigger, and that can go on until God knows what happens.

Mr. HANNAFORD. You have both indicated that Government policy is a major, overwhelmingly the major cause of the cycles, particularly inflation.

Dr. MELTZER. Yes, sir.

Mr. HANNAFORD. You are not suggesting that we should not pursue, consciously pursue fiscal policy and consciously engage in monetary policy by a central banking system.

Before the advent of the Federal Reserve and Keynes, going back into the 19th century, it seems to me I remember an old Cleveland Trust chart that was around for many years in which the peaks and valleys looked like sharks' teeth and a much worse world than we have had since that time; is that right?

Dr. MELTZER. That's correct. We have managed to take some of the worst fluctuations out of the economy. Despite many claims 2 years ago to the contrary, we have managed to avoid a really severe recession in the postwar period. We've had a big recession but by no means the kind of recessions that people experienced during the 19th century or during the earlier part of the 20th century.

Mr. HANNAFORD. And when we say Government policy is the cause, we say that now that we can second-guess Government policy and there is such a thing, that we can sit back and—

Dr. PRERCE. Well, I think it depends on the kind of Government policy. There are some basic policies, deposit insurance, a central bank as lender of last resort, a taxation system that acts as a built-in stabilizer of the economy, and a whole host of factors that serve as a sort of basic background for the economy. These have imparted greater economic stability. But at the same time, the Government has often pursued active policies which have increased instability.

And maybe the standards are wrong. Maybe the Government should follow the tack of saying, well, we only want to pursue those policies which won't make the situation worse, and we will guard ourselves against making the situation worse. We might have better policies than ones that are based on the belief we know enough in order to fine tune, to be able to second-guess what the economy is going to be doing 18 months from now, but without a sufficient realization of what lags. Perhaps there should be a basic background of the Government in its expenditures and taxation in the same sense that there is a background in terms of deposit insurance, that it doesn't change very rapidly.

And my guess is with the tremendous stability we have in the economy now, that it will probably perform better. We have to avoid excesses.

Mr. NEAL. Can you all stay with us for a while? We have a vote.

Mr. HANNAFORD. Well, I do not expect to return. I will not be back, gentlemen. Thank you very much.

Mr. NEAL. I would like to return. If you can stay with us for a while, we will be back.

[A brief recess was taken.]

Mr. NEAL. Have you had a chance to look at our exhibit?

Dr. MELTZER. Yes; I have looked at the chart.

Mr. NEAL. Do you see any problems?

Dr. MELTZER. I think in general the relationship is correct. It is a careful reproduction and extension of earlier work. What the chart

shows is there is about a 2-year lag with no absolute precision or uniformity about the timing. Each time there is a ripple in money, as Dr. Pierce has said, it doesn't show up in price changes. However, it is certainly true that the main movements are shown on the chart. When the rate of monetary growth expands, on average 2 years later we have an increase in the rate of price change, and when the rate of monetary growth slows down, about 2 years later we have a slow down in the rate of inflation. We are now experiencing the results of that process. We should be careful to avoid saying, and I think the paper accompanying the chart does, that the only thing that has any effect on the rate of price change is the rate in the growth of the money stock. A very large fraction of the rate of inflation is explained by past changes in the growth of the money stock.

Mr. NEAL. One thing that would be very helpful to me would be some brief information on the relationships between money and deficits and inflation in foreign countries. You mentioned Brazil, and I imagine you could talk about Argentina and maybe Chile and Germany. It is a fascinating story and one we just don't have.

Dr. MELTZER. I will submit two recent papers—neither of them my own—one by Michael Hamburger and Rutbert D. Reisch and the other by Robert Lucas looking at some of the relationships between rates of inflation in other countries. There has been no systematic study of what's happened in each and every country, but I think there is some information about foreign countries that is consistent. I will be glad to make available what I have.

Mr. NEAL. Very well. Absent any objection, I would like to have inserted in the record at this point both papers and other related information.

Dr. MELTZER. Fine.

[The papers submitted by Dr. Meltzer on studies of inflation abroad by Michael J. Hamburger and Rutbert D. Reisch entitled "An Empirical Analysis of Inflation, Unemployment and Macroeconomic Policy in Open Economies" and by Robert E. Lucas, Jr., entitled "Some International Evidence on Output-Inflation Tradeoffs," follow:]

AN EMPIRICAL ANALYSIS OF INFLATION, UNEMPLOYMENT AND MACROECONOMIC POLICY IN OPEN ECONOMIES

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During 1974, there was a sharp and unanticipated upward surge in the United States' price level. The most common reaction to this development among popular commentators and, to some extent, professional economists was that something was seriously wrong with traditional economic analysis, in general, and its explanation of inflation, in particular. Although the force of this argument was substantially weakened by the economy's apparently rapid response to the restrictive monetary policy pursued during the second half of 1974 and the early part of 1975, it seems reasonable to consider this a temporary phenomenon. Future spurts of inflation or other unexpected events are likely to renew the call for alternative approaches to analysis and policy which promise greater control over the economy.

This study has two principal objectives. First, we seek to determine the extent to which existing theory can explain fluctuations in prices and output (employment). Within the limits of this knowledge, we then attempt to evaluate the role that traditional economic policy can play in moderating these fluctuations. Consequently, the analysis is not restricted to the American experience in 1974. Instead, we examine the explanatory power of a set of relatively standard macroeconomic models across a number of countries and time intervals. The work drawn upon is that of Lucas (1973), Stein (1976) and Korteweg (1975). Lucas' model treats aggregate demand as an exogenous variable and seeks to explain the trade-off between real output and inflation, under the assumption that suppliers possess rational price expectations. The model is tested using data for nearly twenty open economies, but no allowance is made for any special effects which the international sector may have on the domestic economy.

The Stein model, which was developed to help resolve some outstanding issues in the monetarist controversy as it pertains to the U.S. economy, is more traditional. Aggregate demand is taken to depend on domestic policy variables and little attention is devoted either to the foreign sector or to supply behavior. Reduced-form equations are explicitly derived to explain the rate of price change and the unemployment rate. Korteweg's work, which is specifically

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oriented to the Dutch economy, relies heavily on the Brunner-Meltzer (1974,) (1976) analyses of open and closed economies. The reduced-form equations he develops for aggregate production and the inflation rate are similar in spirit to Stein's. One important difference is that Korteweg includes two variables to measure the influence of the foreign sector.

In the analysis which follows, we first update the Lucas equations for the United States, the United Kingdom, Germany, France, and the Netherlands. Second, we modify the Stein model in the manner suggested by Korteweg and estimate the resulting equations for the U.S., the U.K., Germany, and the Netherlands. Finally, we assess these alternative approaches to the inflation/real output trade-off and draw implications for the efficacy of macroeconomic stabilization policy.

I. INFLATION, OUTPUT AND AGGREGATE SUPPLY

In the final analysis, real output and inflation should result from a two-equation system describing aggregate demand and aggregate supply. We concentrate first on the supply side only and treat aggregate demand as an exogenous variable. To describe suppliers' behavior and to explain real output, we adopt Lucas' (1973) approach. Lucas assumes that aggregate supply depends on the discrepancy between actual and expected prices, and on the cyclical component of last period's real output. Aggregate demand - - determined exogenously and hence a proxy for all policy variables - - is assumed to be of unit-price elasticity, which implies that the breakdown of nominal aggregate demand into prices and real output is entirely supply-determined.

More specifically, Lucas assumes rational suppliers distributed over a large number of competitive markets with unevenly distributed demand in which suppliers know the price $P_t(z)$ in market z at time t and the history of the system, but not the current general price level P_t . In each market z , supply consists of a long-run trend component y_{nt} common to all markets, and a cyclical component y_{ct} :

$$(1) \quad y_t(z) = y_{nt} + y_{ct}(z) \quad (\text{log of real output in } z \text{ at } t),$$

with

$$(2) \quad y_{nt} = a + \beta t \quad (\text{log of trend component of real output});$$

and the cyclical component determined by $P_t(z)$ relative to the general price level P_t expected on the basis of information $I_t(z)$ available in z at time t , and by its own lagged value:

$$(3) \quad y_{ct} = \gamma[P_t(z) - E(P_t/I_t(z))] + \lambda y_{c,t-1}(z),$$

where all symbols denote the logarithms of the variables.

Assuming the unknown general price level P_t is normally distributed with mean \bar{P}_t and variance σ^2 , and that $P_t(z) = P_t + z$ where z is distributed normally with mean 0 and variance τ^2 and independently of P_t , the joint density function is:

$$\begin{aligned} f(P_t, P_t(z)) &= \frac{1}{2\pi\sigma\tau} e^{-\frac{1}{2}\left[\frac{(P_t - \bar{P}_t)^2}{\sigma^2} + \frac{(P_t(z) - P_t)^2}{\tau^2}\right]} \\ &= \frac{1}{2\pi\sigma\tau} e^{-\frac{1}{2}\left[\frac{(\bar{P}_t - P_t)^2}{\sigma^2} + \frac{(P_t - P_t(z))^2}{\tau^2}\right]} \\ &= f(\bar{P}_t, P_t) = f(P_t|\bar{P}_t) \cdot h(\bar{P}_t), \end{aligned}$$

$$\text{with } h(\bar{P}_t) = \int_{-\infty}^{\infty} f(\bar{P}_t, P_t) dP_t.$$

Collecting terms in P_t , substituting

$$\sqrt{\frac{1}{\sigma^2} + \frac{1}{\tau^2}} \left[P_t \cdot \frac{\frac{\bar{P}_t}{\sigma^2} + \frac{P_t(z)}{\tau^2}}{\frac{1}{\sigma^2} + \frac{1}{\tau^2}} \right] = \rho,$$

$$\text{and using } \int_{-\infty}^{\infty} e^{-\rho^2/2} d\rho = \sqrt{2\pi},$$

the marginal density function can be written as:

$$h(\bar{P}_t) = \frac{1}{\sqrt{2\pi} \sqrt{\sigma^2 + \tau^2}} e^{-\frac{1}{2}\frac{(\bar{P}_t - P_t(z))^2}{\sigma^2 + \tau^2}}.$$

Dividing this into $f(\bar{P}_t, P_t)$:

$$(4) \quad f(P_t | \bar{P}_t) = \frac{\sqrt{\sigma^2 + \tau^2}}{\sqrt{2\pi} \sigma \tau} e^{-1/2 \frac{\sigma^2 + \tau^2}{\sigma^2 \tau^2} \left[P_t - \frac{\tau^2 \bar{P}_t + \sigma^2 P_t(z)}{\sigma^2 + \tau^2} \right]^2}.$$

$$\text{Hence, } E(P_t | \bar{P}_t, P_t(z)) = \frac{\tau^2 \bar{P}_t + \sigma^2 P_t(z)}{\sigma^2 + \tau^2},$$

$$\text{and } V(P_t | \bar{P}_t, P_t(z)) = \frac{\sigma^2 \tau^2}{\sigma^2 + \tau^2}.$$

Introducing $\theta = \frac{\tau^2}{\sigma^2 + \tau^2}$, the mean and the variance can be expressed:

$$E(P_t | \bar{P}_t, P_t(z)) = (1 - \theta) P_t(z) + \theta \bar{P}_t,$$

and

$$V(P_t | \bar{P}_t, P_t(z)) = \theta \sigma^2.$$

Combining $E(P_t | \bar{P}_t, P_t(z))$, (1), and (3), and averaging over all markets z yields the aggregate supply function:

$$(5) \quad y_t = y_{nt} + k[P_t - \bar{P}_t] + \lambda[y_{t-1} - y_{n, t-1}],$$

with $k = \gamma\theta$

Lucas' aggregate supply function, which we will use for our empirical analysis, is only one form to describe suppliers' behavior. For instance, the aggregate supply function could depend only on the discrepancy between actual and expected prices (Sargent, 1973):

$$(6) \quad y_t = y_{nt} + k(P_t - E(P_t));$$

or include several lagged values of the cyclical component:

$$(7) \quad y_t = y_{nt} + k(P_t - E(P_t)) + \sum_{i=1}^T \lambda_i (y_{t-i} - y_{n, t-i});$$

or incorporate adjustments in expected future price movements:

$$(8) \quad y_t = y_{nt} + k[P_t - E(P_t) - \left(\frac{1}{n} \sum_{i=1}^n E P_{t+i} - \frac{1}{n} \sum_{i=1}^n E P_{t-i}\right)] \\ + \sum_{i=1}^T \lambda_i (y_{t-i} - y_{n, t-i}),$$

which could be further modified by introducing a more sophisticated weighting pattern instead of $\frac{1}{n}$. Finally, $E(P_t)$ has to be specified. A simple formulation is the well-known adaptive expectations model:

$$(9) \quad E(P_t) = \sum_{i=1}^{\infty} w_i P_{t-i},$$

which will not be pursued further here. Rather, following Lucas, we assume rational price expectations:

$$(10) \quad E(P_t) = E(P_t | \text{history of the system, policy variables, other exogenous variables}).$$

In this framework, suppliers know past movements of nominal aggregate demand, past shifts of real output, the trend component of real output; and assess current nominal aggregate demand x_t on the basis of:

$$(11) \quad x_t = x_{t-1} + \Delta x_t,$$

where Δx_t is the proxy for a current policy shift which by assumption follows

$$(12) \quad [\Delta x_t] \sim \text{dn}(\delta, \sigma_x^2).$$

Postulating the solution,

$$(13) \quad P_t = \pi_0 + \pi_1 x_t + \pi_2 x_{t-1} + \dots + \eta_1 y_{t-1} + \eta_2 y_{t-2} \\ + \dots + \xi_0 y_{nt},$$

we obtain:

$$(14) \quad E(P_t) = \pi_0 + \pi_1(x_{t-1} + \delta) + \pi_2 x_{t-1} + \dots + \eta_1 y_{t-1} \\ + \eta_2 y_{t-2} + \dots + \xi_0 y_{nt}.$$

To complete this model, Lucas assumes an exogenously determined demand function with unit-price elasticity:

$$(15) \quad x_t = y_t + P_t,$$

where x_t = log of nominal aggregate demand.

Questions may be raised regarding the applicability of this function to an open economy. At the very least, it seems appropriate to distinguish between domestic and foreign prices, both of which are included in P_t . Moreover, with foreign sources of supply available, we would expect the price elasticity of the demand for domestic output to rise and, at least with respect to domestic prices, it could exceed unity.¹

Returning to the standard Lucas model, we solve the system (5), (15), for fluctuations in real output and the inflation rate to obtain:

$$(16) \quad y_{ct} = -\pi\delta + \pi\Delta x_t + \lambda y_{ct-1}, \text{ with } \pi = \frac{k}{1+k};$$

$$(17) \quad \Delta P_t = -\beta + (1 - \pi)\Delta x_t + \pi\Delta x_{t-1} - \lambda\Delta y_{ct-1},$$

$$\text{with } \Delta P_t = P_t - P_{t-1}.$$

Lucas fitted these two equations to annual observations for 18 countries for the period 1953-1967, to test the natural unemployment rate hypothesis by comparing the results for countries with different time patterns of nominal income.

¹ Some support for the latter contention is provided by Arak (1975), who reestimated the Lucas model for the U.S., and found the elasticity of aggregate demand with respect to P_t (the general price level) to be greater than one.

This was not our objective. Instead, we sought to determine whether the model would continue to adequately explain the real output/inflation trade-off when high and fluctuating inflation rates became more the rule than the exception, as they were during Lucas' time period. In particular, we were interested in comparing the performance of the model with the more traditional analyses which focus on the explanation of aggregate demand. Moreover, there are the questions of what effects, if any, the general increase in inflationary tendencies had on the real output/inflation trade-off in different countries, and the extent to which the 1974 experience can be explained from the supply side.

The regressions performed for the period 1953-1973 (Table 1) indicate that the measures of goodness of fit are generally similar to Lucas' except that, whereas his equations explain real output better than prices, we find the same explanatory power to prevail for both output and price equations. (Following Lucas, the unadjusted R^2 is used as the measure of goodness of fit in these equations. The equations are estimated without constraints. Comparing the coefficients of the output and price equations shows that the model performs reasonably well. While it is interesting to note that the U.S. shows the most favorable trade-off in the concurrent period, no conclusions can be drawn from the price equations as to how the inflationary impact is distributed over time, since the full effect on prices must be transmitted in the concurrent and subsequent periods on the basis of the model's specification.

To test for structural shifts, we also ran our regressions for two sub-periods - - 1953-1962 and 1963-1973 - - in order to investigate whether the trade-off terms have changed significantly during the period 1953-1973. The Chow test reveals that eight of the 10 equations (five for output, five for prices) show no significant shift between the two sub-periods. This suggests that overall the trade-off terms have neither improved nor deteriorated during 1953-1973. The Chow test rejects the hypothesis of no shift only for the output equations of Germany and the Netherlands. Since such a shift in the output equations should be accompanied by a shift in the corresponding price equation - - which is not the case here - - this result is probably of little relevance. However, the deterioration in the trade-off terms observed for Germany and the Netherlands is of some interest. The reason for any given stimulatory policy to be reflected in a significantly smaller increase in real output in the later period may be the changing labor supply conditions between the two periods; until 1961, there was a continuous labor inflow from East Germany as some 3 million people were absorbed by the German economy after 1945. On the other hand, labor migration from other E.E.C. countries into Germany did not take place on any substantial scale until the late sixties. Thus, the highly elastic labor supply in the earlier period may account for the more favorable trade-off terms during that

period. For the Netherlands (where the Chow test is far less significant), it is conceivable that the results simply reflect the change in Germany's labor market conditions, since the Dutch economy is closely linked to Germany's through its export sector.

Finally, we tested the model's ability to predict. Using the results presented in Table 1 to predict 1974 real GNP and the inflation rates for the U.S. and Germany shows that real GNP is overpredicted and the inflation rate underpredicted for both countries. For the U.S., the predicted GNP was \$871.3 billion (1958 prices) versus the actual \$821.6 billion; for Germany, it was DM 625.8 billion (1962 prices) versus the actual DM 596.4 billion. The annual inflation rates, on the other hand, are forecast at 6.2 percent for the U.S. versus the actual 9.7 percent, and at 4.0 percent for Germany versus the actual 6.4 percent. The difference between the actual and predicted GNP deflators -- 3.5 percentage points for the U.S. and 2.4 percentage points for Germany -- may be accounted for by the foreign sector, which is not explicitly included in Lucas' model. Specifically, the sharp boost in import prices beginning in late 1973 -- largely because of escalating oil prices -- must have caught suppliers by surprise, and should help to explain the divergence of predicted from actual values. Therefore, it seems more appropriate to test the models' predictive ability for 1973. Running the regressions for the period 1953-1972, and then predicting the 1973 values, reveals that real GNP is overpredicted for the U.S., Germany, and the Netherlands; and underpredicted for the U.K. and France (Table 2). Conversely, inflation rates are underpredicted for the U.S. and the Netherlands, overpredicted for the U.K. and France, and forecast correctly for Germany.

The absence of significant shifts over time suggests that the underlying structure is stable and that the model reflects basic trends. Short-run predictions, however, remain problematic since various exogenous factors not incorporated in the model can exert a sizable impact on output and prices. For the 1974 predictions, the oil crisis is one such factor. For 1973, the forecast errors are smaller for countries with stable import prices (Table 2). Price controls are another exogenous factor not incorporated in the model; they also help to explain the comparatively large 1973 forecast errors in inflation rates for the U.S. and the U.K. Presumably, the reported U.S. inflation rate was "catching up" in 1973 after the 1971 and 1973 price controls, thereby overstating the "true" inflation rate. On the other hand, the U.K. imposed a total price freeze from November, 1972, to April 1973, which was followed by somewhat relaxed controls, hence suppressing "true" inflationary pressures. Thus, the forecast errors in the inflation rates are consistent with the impact of price controls on the 1973 inflation rates in both countries.

II. AGGREGATE DEMAND

We turn next to the more traditional approach to macroeconomic analysis, i.e., models that focus on the determination of aggregate demand. Stein's (1976) study is used as the basis for this analysis because of its simplicity, its completeness, and the impressive empirical results that he reports. The purpose here is to evaluate the applicability of such models to countries with different economic structures, and to compare their explanatory power to that of the supply-oriented approach discussed above.

Included in the Stein model are: a labor market characterized by wage and price flexibility and an endogenously determined unemployment rate; asset markets for capital and bonds; an excess demand equation for goods; two price-change equations; and a government budget constraint.

In summary form, the model may be expressed by the following equations:

$$(18) \quad \text{real wage change, } \frac{\Delta w}{w} = \alpha + \pi^* - \pi + h(U),$$

where π is the rate of price change, π^* is the currently expected rate of price change, and $h(U)$ is a function of the unemployment rate, $h < 0$;

$$(19) \quad \text{unemployment rate, } U = F\left(\frac{w}{A(t)}, G_1\right),$$

where $A(t)$ is the level of productivity which grows at rate α and G_1 is the government demand for labor (per unit of capital);

$$(20) \quad \text{bond market, } \rho = g(U, \pi^*, m, \theta),$$

where ρ , the nominal rate of interest depends on m , real money balances (per unit of capital), θ , the ratio of government interest-bearing debt to the money supply, U and π^* ;

$$(21) \quad \text{government budget constraint, } G - T = [\Delta\theta + (1 + \theta)\mu]m,$$

where $G - T$ denotes real government purchases of goods and services minus real taxes (both per unit of capital), and μ is the rate of monetary expansion;

$$(22) \quad \text{Change in real money balances/capital, } \frac{\Delta m}{m} = \mu - n - \pi,$$

where the only new variable, n , is the growth rate of capital;

$$(23) \quad \text{price change, } \pi = P(U, \pi^*, m, G, \theta);$$

$$(24) \quad \text{adaptive price expectations, } \pi^* = b(\pi - \pi^*).$$

A key element of the model is the price-change relationship (23), which is assumed to represent the sum of two elements: a demand-pull effect and a cost-push effect. The cost-push effect is $\frac{\Delta W}{W} - a$, the growth of the nominal wage in excess of the rate of labor augmenting technical change. The demand-pull effect is a function of real excess demand for goods per unit of capital, E . Letting λ_p denote a finite speed of response, this hypothesis may be expressed:

$$(25) \quad \dot{\pi} = \left(\frac{\Delta W}{W} - a \right) + \lambda_p E(\cdot),$$

where the real excess demand for goods per unit of capital is the sum of real planned investment (I) plus real planned consumption (C) plus real government purchases (G) less output (y) all per unit of capital; i.e. :

$$(26) \quad E \equiv C + I + G - y.$$

Noting that $\Delta W/W = \Delta w/w + \pi$, substituting (18) into (25), and writing E as a function of π^* , m , G , θ , and U yields the price-change equation (23).

Solving this system, Stein obtains estimation equations for the rate of price change (π) and the unemployment rate (U) in terms of three independent control variables: the rate of monetary growth (μ); real government purchases of goods and services per unit of capital (G); and the ratio of government interest-bearing debt to the money supply.

$$(27) \quad U(t) = \text{const.} + a_1 U(t - \delta) + a_2 \pi(t - \delta) + a_3 \sum_1^{\delta} \mu(t - i) \\ + a_4 \sum_1^{\delta} G(t - i) + a_5 \sum_1^{\delta} \theta(t - i) + j_1(t).$$

$$(28) \quad (t) = \text{const.} + b_1 U(t - \delta) + b_2 \pi(t - \delta) + b_3 \sum_1^{\delta} \mu(t - i) \\ + b_4 \sum_1^{\delta} G(t - i) + b_5 \sum_1^{\delta} \theta(t - i) + j_2(t),$$

where j_1 and j_2 are error terms; δ is an arbitrary constant; and $t - \delta$ represents some earlier time period. Thus, conditions at time t are assumed to depend on the state of the world at $t - \delta$ and on the pattern of control inputs applied from that date to the present.

The Stein model is appealing but contains a number of deficiencies. Among the more important ones, from our point of view, are the treatment of price expectations, and the failure to make any explicit allowance for the influence of the foreign sector on the domestic economy. There is now considerable evidence to suggest that an autoregression on past price movements may not be the most appropriate model of inflationary expectations.² A prominent alternative is to assume that economic units form their expectations rationally, i.e., they make some effort to learn the structural model that describes the economy and form their expectations accordingly. Given the current level of abstraction, it is not clear how the model's solution would be altered by the replacement of equation (24) with a rational expectations scheme. Hence, we have assumed that π^* may be treated as an endogenous variable, and that this is why Stein failed to obtain significant coefficients for the variable when it was included in equations (27) and (28). Consequently, like Stein, but for different reasons, we do not include an explicit measure of inflationary expectations in the estimation equations.

On the other hand, it does seem important to modify the model to incorporate the influences on the domestic economy emanating from the foreign sector. Here we follow Korteweg (1975), who identifies two kinds of foreign trade impulses: those relating to variations in the foreign sector's demand for private domestic output; and those relating to changes in the prices the home country has to pay for its imports of goods and services (the effects of international capital flows other than those which occur as a result of changes in the domestic monetary base on the money supply, are not considered).

The foreign sector's demand for domestic output is measured by Korteweg's weighted volume of world trade, e - a measure of predetermined exports:

$$e = \sum_f w_f a_f,$$

² See, for example, Fama (1975), Rutledge (1974), Sargent (1973), and Lucas (1973).

where i_f denotes the total import demand of each of the home country's trading partners; and w_f , a weighting factor, is measured as:

$$w_f = \left[\frac{(i_{fh})}{i_f} \right]^{-1},$$

the share of trading partner f 's imports in the preceding period which came from the home country. In other words, e indicates the volume of a country's exports, assuming that the distribution of all its trading partners' imports remain unchanged from the previous period.³

As a measure of the influence of foreign prices on the domestic economy, we use the index of home country import prices denominated in the local currency. The effect of changes in import prices, arising either from variations in foreign prices *per se* or from changes in exchange rates, depends on the degree of substitutability between domestic and foreign goods, and whether the effects are transmitted through the supply or the demand side of the domestic economy. Thus, to the extent that there are no domestic substitutes for imported goods, a rise in the price of the latter could be contractive with respect to domestic employment (output) and prices.

To incorporate the above discussion in the Stein model, we rewrite the price-change equation (25):

$$(25) \quad \pi = \left[\left(\frac{\Delta W}{W} - \alpha \right) + \gamma(p_m) \right] + \lambda p E(U, \pi^*, m, G, \theta, e, p_m),$$

where p_m , the percentage change in the index of import prices, is added to both the cost-push and demand-pull components of (25); and e , the measure of pre-determined export demand, is included as an additional determinant of excess demand. As a result of this substitution equation (23) may be replaced by

$$(23') \quad \pi = P(U, \pi^*, m, G, \theta, p_m, e).$$

³ An alternative measure of the foreign sector's demand for domestic output is the volume of the home country's exports. The problem with this measure is that, to the extent a country's exports depend on the current value of the domestic price level relative to foreign prices, it will be at least partially endogenous.

Solving this extended version of the model yields the estimation equations relevant for an economy that is open to international trade:

$$(27') \quad U(t) = \text{const.} + a_1 U(t - \delta) + a_2 \pi(t - \delta) + a_3 \sum_1^{\delta} \mu(t - i) \\ + a_4 \sum_1^{\delta} G(t - i) + a_5 \sum_1^{\delta} \theta(t - i) + a_6 \sum_1^{\delta} p_m(t - i) \\ + a_7 \sum_1^{\delta} e(t - i) + j_1(t);$$

$$(28) \quad \pi(t) = \text{const.} + b_1 U(t - \delta) + b_2 \pi(t - \delta) + b_3 \sum_1^{\delta} \mu(t - i) \\ + b_4 \sum_1^{\delta} G(t - i) + b_5 \sum_1^{\delta} \theta(t - i) + b_6 \sum_1^{\delta} p_m(t - i) \\ + b_7 \sum_1^{\delta} e(t - i) + j_2(t).$$

To test the proposition that the extended version of the Stein model provides a general explanation of price and employment movements, our intention was to estimate equations (27') and (28') for the five countries under consideration. Unfortunately, data limitations restricted this portion of the analysis to four countries: Germany; the Netherlands, the United Kingdom and the United States. Furthermore, the data for Germany and the Netherlands are measured on annual average bases and hence do not permit a reproduction of Stein's lag structure.⁴

One modification that was introduced into the estimation procedure, even for the U.S. where data is plentiful, is to take observations on the dependent variables spaced four quarters apart rather than every quarter. This is done to eliminate any problems that might result from seasonal variation in the data, and to reduce the serial correlation which might be introduced into equation

⁴ In estimating his equations, Stein assumed that $\delta = 3$. This implies that each dependent variable is a linear function of all the dependent variables three quarters ago and a simple unweighted average of each of the control variables over the three previous quarters. While no justification is provided for this structure and it seems doubtful that it represents a crucial element in the specification, the model did fit the U.S. data more closely when we approximated Stein's lag structure, as opposed to incorporating the restrictions imposed by annual average data.

(28') because of the way π is measured, i.e., as the rate of price change over the past three quarters.⁵ Finally, because θ was the least significant policy variable in Stein's tests and because of the well-known conceptual problems associated with measuring the public debt, θ is excluded as a control variable from all tests.

With these modifications, Stein's closed-economy equations, (27) and (28) were fitted to U.S. data for the period 1954:IV to 1970:IV. Our purpose was to determine the combined effects of: (1) the changes in the estimation procedure; and (2) the lengthening of the sample period (the most common period used by Stein was 1960:IV to 1970:IV). The results shown in the center of Tables 3 and 4 are quite similar to Stein's, reproduced in the left-hand columns of the tables. The main differences in the results are a substantial drop in the serial correlations of the residuals and a decline in the significance of money, (μ) in the price-change equation. However, given the similarity in the parameter estimates, and the much smaller number of degrees of freedom in our sample as compared to Stein's (12 versus 36), this finding may be neither very surprising nor disturbing. (To facilitate comparison of our results with Stein's, the unadjusted R^2 is used as the measure of goodness of fit in these tables; hereafter, we use R^2 .)

We next test for the influence of exports and import prices on employment and the inflation rate. The right-hand columns of Tables 3 and 4 present the parameter estimates and other results for equations (27') and (28'), when all insignificant variables are eliminated, and the lagged value of μ is substituted for the current value. Assuming that p_m and e are at least approximately exogenous, the evidence provides strong support for the proposition that the U.S. is an open economy. Exports are highly significant with the appropriate sign in both equations. Moreover, during the sample period, 1954-1970, increases in import prices tended to reduce aggregate output (employment), but apparently had little impact on the domestic price level. The latter result is a bit puzzling, but it makes it somewhat difficult to attribute the open economy results for the U.S. to the endogeneity of the index of import prices.

The effects of changes in the domestic policy variables are also interesting. According to the right-hand columns of Tables 3 and 4, a change in the growth rate of the money supply first affects real output and employment, and then, prices. Such a result is consistent with the generally accepted view of how monetary policy influences the economy, and with our earlier findings for the Lucas model. The estimates of the effects of fiscal policy are similar to most

⁵ Another adjustment incorporated in the estimation procedure -- as much for convenience as any other reason -- was to allow the control variables to begin to influence the state variables in the current period. As a result, the summations associated with each of the control variables in equations (27') and (28') now begin at zero instead of one. With the dependent variables measured in the fourth quarter of the year, this permits the use of annual averages for the control variables, which may be an important simplification for countries other than the U.S.

other analyses of this type. They suggest that such policy operations have no significant effect on either employment or prices.

A final test of the applicability of the Stein model to the U.S. is provided by extrapolating the price and unemployment equations through 1974. The results shown in Tables 5 and 6 are not very impressive, but the patterns of the errors are informative. The open-economy equation, (28'), does a good, but not outstanding, job of tracking the inflation rate during the post-sample period. Considering the insignificance of the import-price-coefficient during the sample period, this may not be very surprising. As far as the unemployment rate is concerned, the closed-economy model, equation (27), provides the superior predictions. There is a sense, though, in which the open-economy results are the more reasonable of the two. Indeed, the major problem with the 10.3 percent unemployment rate prediction for 1974:IV could be that it occurred one quarter too soon.

Let us now turn briefly to the results for other countries. Those for the U.K. do not support the open-economy version of the Stein model. Although the estimates of goodness of fit for the U.K. inflation and unemployment equations are similar to those for other countries, all efforts to obtain statistically significant parameter estimates consistent with standard macroeconomic theory proved unsuccessful. The only variable whose parameter even approached statistical significance was ΔG , and it invariably had the wrong sign, both currently and with a one-year lag, i.e., increases in government expenditures were associated with increases in the unemployment rate and a fall in inflation. Such results cast some doubt on the general applicability of the Stein model. However, in the case of the U.K., the problem may simply be due to multicollinearity among the variables included in equations (27') and (28').

Turning to the Netherlands, we again draw on the work of Korteweg (1975). In explaining Dutch inflation during the 1953-1973 period, he finds the most important determinants to be: the lagged rate of change in the narrow-money supply; the rate of unused industrial capacity lagged one year, $Q(t - \delta)$, which serves the same function as the lagged unemployment rate in our specification; and a summary measure of the effects of changes in government policy variables, such as indirect taxes, subsidies, rents, and E.E.C. and Kennedy-round adjustment measures, $p_{au}(t - \delta)$.

The parameter estimates for Korteweg's price-change equation (fitted to annual averages of the variables) are shown on the left side of Table 7. The results on the right side are those for a similar equation estimated for the period 1953-1971. This shorter time interval was used in an attempt to obtain a consistent series for the unemployment rate. Although such a series is obtainable for this period, it appears less appropriate than the rate of unused industrial capacity

as an indicator of the slack in the Dutch economy. Consequently, we follow Korteweg and use $Q(t - \delta)$, rather than $U(t - \delta)$, as a lagged state variable, and do not report the parameter estimates for the unemployment rate equation.⁶

Two aspects of the results warrant particular attention. First, regardless of the sample period, the most important determinant of year-to-year variations in the Dutch price level (as measured by the t-statistics) is p_{au} , a policy variable specific to the Netherlands. Its omission from the 1953-1971 regression causes the coefficients of most other variables to lose statistical significance. Second, when the sample period is extended to include 1972 and 1973, the effects of import prices and fiscal policy (ΔG), become difficult to assess, i.e., the t-statistics drop below 1.20. Since these were years in which the money supply and the price level both rose very rapidly, the problem may be that the parameter estimates are sensitive to the movements in the variables. Even if the apparent instability in the Dutch price-change equation can be explained in this way, the present results, like those for the U.K., raise questions regarding the general usefulness of the Stein model. For example, the sensitivity of the estimates of the parameters in the Dutch price level equation to the inclusion of p_{au} suggest that unless all important policy variables are included in the specification, it may be difficult to measure the effects of those that are.

German data accord the Stein model a more favorable reception. The inflation-rate equation (fitted to annual averages of the variables for the period 1960-1973) is quite similar to its U.S. counterpart (see Table 8). According to both equations, the principal determinants of year-to-year movements in the price level are: the lagged unemployment rate; the growth rate of the money supply; and the foreign sectors' demand for domestic output. Moreover, unlike the Netherlands, the results for Germany and the U.S. reveal no significant instability in the parameters when the sample periods are extended beyond 1971. However, there are two interesting differences in the way the price level responds to changes in its determinants in the latter countries. First, as might be expected, increases in foreign demand appear to be more inflationary in Germany than in the U.S. Second, the insignificance of the lagged price-change term in Table 8 suggests that, regardless of the stimulus, the domestic price level responds more quickly to changes in its determinants in Germany than in the U.S. This may also be a consequence of the greater openness of the German economy. Whatever the reason, the similarity between this result and the corresponding one for the Lucas model would seem to increase our confidence in both formulations.

⁶ However, these estimates were generally consistent with the implications of the Stein model.

III. ASSESSMENT, INTEGRATION AND POLICY IMPLICATIONS

The empirical evidence presented in the previous sections does not lend itself to an unambiguous interpretation of the ability of existing theory -- as represented by the Lucas and Stein models -- to explain fluctuations in prices and output. Tests of the Lucas model suggest considerable stability on the supply side of the Dutch, French, German, U.K., and U.S. economies. Moreover, with the exception of the U.K., the constraints the model imposes on the parameters are generally fulfilled. On the other hand, the model fails to explain the extent of the 1974 price increases in all the countries included in the sample. Considering the focus of the Lucas model -- the supply side of the domestic economy -- and one of the important causes of the 1974 disturbance -- a sharp, unanticipated increase in the import prices -- it is difficult to assess the seriousness of this deficiency.

The results for the Stein model, which focuses on the sources of variation in aggregate demand, differ in some respects from those for the Lucas formulation. Nevertheless, the overall performance of the two approaches is similar. For Germany, the Netherlands, and the U.S., Stein-type price equations fit the data quite closely, and the specific determinants of the price movements are readily identifiable. The difficulties with this formulation are: (a) the equations do not fit the U.K. data very well; and (b) for other countries, there is considerable variation in the parameter estimates both over time and across countries. One noteworthy element of constancy, though, is that the growth rate of the money supply always appears as a significant determinant of the inflation rate. Finally, the errors involved in explaining the 1974 price movements are of the same order of magnitude as those for the Lucas model.

Three properties of the results are of particular interest. First, the overall comparability in the explanatory power of supply- and demand-oriented models suggests that the overriding attention macroeconomics devotes to the latter may be misplaced. The qualitative similarity in results for the various countries examined is also an important finding, implying that the underlying structures of these economies may have more elements in common than not. However, the variability of the parameters in Stein's aggregate demand model is a matter of concern. It suggests that such a model, and the theory upon which it rests, does not provide a general explanation of year-to-year fluctuations in prices and output.

A number of hypotheses could be put forward to account for this deficiency. The one we wish to explore holds that although simple aggregate demand models of the Stein type can identify longer term economic trends, a year is too short a period in which to observe such movements. Such a view

stands in sharp contrast to current econometric practice which seeks to explain not only annual fluctuations in economic data but quarterly movements as well. The specific formulation we use to test our hypothesis posits that, over five-year periods, the growth rate of the money supply is a reliable predictor of the growth of nominal income and, for all practical purposes, this is independent of a country's institutional structure:⁷

$$(29) \quad \dot{Y}_{it} = a + b\dot{M}_{it} + \epsilon_{it},$$

where \dot{Y}_i is the five-year growth in nominal income of country, i , measured from the average annual level of Y ;

\dot{M}_i is the five-year growth in the narrow-money supply of country, i , measured from end-of-year to end-of-year, so that each observation leads the corresponding one for \dot{Y} by approximately one-half year;

a and b are constant both over time and across countries;

ϵ_i is an error term.

Data for four countries (Germany, the Netherlands, the U.K., and the U.S.) are used to estimate a and b , with five non-overlapping observations spanning the sample period, 1951-1975, for each country.⁸

The parameter estimates and other results presented in the left-hand column of Table 9 indicate that equation (29) fits the data rather closely. However, the key results - - the t -statistics for a and b - - do not provide a powerful test of the hypothesis that these coefficients are the same for all countries. The other results in Table 9 address this question directly. Those in the middle column report the estimates for equation

$$(29a) \quad \dot{Y}_{it} = a + b\dot{M}_{it} + a_{us}D_{us} + b_{us}D_{us}\dot{M}_{it}.$$

This equation is similar to (29), except that it includes the dummy variable D_{us} which equals 1, when U.S. data are used in the equation, and zero otherwise.

⁷ The choice of a five-year time period is somewhat arbitrary. For the U.S., though, such a period corresponds roughly to a complete business cycle. One problem in using such a long observation period is that it substantially reduces the sample size and hence restricts the number of independent variables that can be considered. We focus on the money supply because it is the one variable that was consistently found to be significant in the Stein equations.

⁸ All observations are five-year growth rates, except those for the last period, 1971-74, which are three-year rates extrapolated to five years. It is important that the observations be non-overlapping because otherwise we run the risk of introducing complicated serial correlation patterns among the residuals. The data are from the International Financial Statistics (IFS)-1972 Supplement. The most recent figures are drawn from later IFS issues and/or national sources.

It is easily shown that the estimated values of a_{US} and b_{US} represent the differences in the parameters for the U.S. and the average of the other countries.⁹ Since the t-statistics for both of these coefficients are less than 2, we may reject the hypothesis that the U.S. parameters taken individually are significantly different from the average of the others. The F-statistic presented at the bottom of the column is substantially less than its critical value at the 5 percent confidence level. This implies that we may also reject the hypothesis that the two U.S. parameters taken together are different from their counterparts in the other countries.

The numbers in the right-hand column of Table 9 may be used to assess the hypothesis that the parameters for each of the other three countries (the U.K., Germany, and the Netherlands), taken separately, are different from those for the U.S. Once again, both the F- and the t-statistics lead us to reject this view. Numerous other combinations of parameters could be considered and some of them were, in fact, evaluated. In every case, though, we were unable to reject the hypothesis that the data for all countries were drawn from the same population.

Given the difficulties encountered with the Stein model, it is also relevant to test our simple quantity theory model for temporal stability. Here, equation (29) was reestimated, dropping the last observation for each country. The parameter estimates are essentially identical to those shown in Table 9, while the standard error of the equation increases slightly to 8 percent (1.6 percent at an annual rate).

$$(29') \quad \dot{Y} = 27.38 + .61\dot{M}.$$

(7.17) (6.21),

$$R^2 = .72; \text{ S.E.} = 7.96; \text{ DW} = 1.44$$

(sample period, 1951-1970).

When equation (29') is extrapolated through the last observation, 1971-74, the following error statistics are obtained.

⁹ Put another way, the regression coefficients for the other countries are given by a and b , while those for the U.S. equal $a + a_{US}$ and $b + b_{US}$.

	<u>Predicted</u> <u>Income Growth</u>	<u>Actual</u> <u>Growth</u>	<u>Difference</u>
United States	46.9	54.1	-7.2
United Kingdom	68.0	72.1	-4.1
Germany	62.1	51.1	11.0
Netherlands	67.2	71.9	-4.7

Relative to the standard error of the equation the predictive errors are small and offsetting. Thus, the same stable long-run relationship appears to exist between money and income in all the countries, explaining the events of the early 1970s as well as it does those of the 1950s and 1960s. Considering the differences in the money-supply processes in these economies and their evolution over time, the results are impressive.¹⁰ They suggest that, over five-year periods, variations in the growth of money have a significant and well determined effect on the growth of income, essentially independent of the process that determines the money stock.¹¹

Over periods as long as five years, we would expect, and the data tend to confirm, that most of the effects of changes in the money supply are on prices. It would be desirable to go further and make more precise statements regarding the effects of monetary policy and the determinants of inflation. At the moment, we are unable to do so. Although all the economies we considered exhibited considerable structural stability in both the short- and the long-run, in the course of a year (or less), numerous exogenous factors can exert a sizable impact on output and prices, and overshadow the effects of money. Over longer periods, though, it is clear that increases in the money supply, which exceed the growth in real output, will result in a predictable amount of inflation. Thus, we find that, to the extent governments (or their central banks) are able to control the domestic money stock, they will be able, within narrow limits, to determine a country's long-run inflation rate. Whether they choose to exercise such control is, of course, another question.

¹⁰ Among the reasons for these differences and the variation over time are: the position of the dollar as a reserve currency; the development of the international payments mechanism; and the emphasis each central bank has given to the control of interest rates and the money supply.

¹¹ The close fit of our general model, equation (29), to the U.K. data ($\bar{R}^2 = .88$) suggests that, despite the fact that the Bank of England has not sought to actively manage the growth rate of the narrow money supply, variations in this variable have had the same important impact on economic activity in Britain as they have in other countries. Hence, the present results are in strong opposition to the views expressed by Kaldor (1970).

Table 1

Lucas Output Equation

$$y_{ct} = -\pi\delta + \pi \Delta x_t + \lambda y_{ct-1}$$

R^2

U.S.	1953-73	- .050 (-7.566)	0.782 (7.993)	0.756 (9.363)	0.8824
U.K.	1953-73	- .012 (-1.311)	0.184 (1.483)	0.550 (2.804)	0.3258
Germany	1953-73	- .052 (-3.521)	0.614 (3.842)	0.862 (8.714)	0.8169
France	1953-73	- .011 (-1.074)	0.103 (1.026)	0.741 (4.520)	0.5351
Netherlands	1953-73	- .037 (-3.415)	0.408 (3.726)	0.655 (4.848)	0.6571

Lucas Price Equation

$$\Delta P_t = -\beta + (1 - \pi)\Delta x_t + \pi \Delta x_{t-1} - \lambda \Delta y_{ct-1}$$

R^2

U.S.	1953-73	- .038 (-4.533)	0.090 (1.460)	0.971 (7.296)	- .746 (-5.798)	0.7894
U.K.	1953-73	- .025 (-2.110)	0.513 (2.823)	0.440 (1.900)	- .046 (- .228)	0.6921
Germany	1953-73	- .061 (-3.282)	0.402 (3.200)	0.662 (4.053)	- .666 (-3.706)	0.6051
France	1953-73	- .054 (-4.152)	0.886 (8.229)	0.132 (1.483)	- .165 (- .799)	0.8236
Netherlands	1953-73	- .037 (-2.359)	0.470 (4.021)	0.403 (2.710)	- .284 (-1.380)	0.6707

Table 2

1973 - Forecasts of Real GNP and Inflation Rates on
Basis of Lucas 1953-1972 Regressions

	Real GNP (billions of units)		Inflation Rate (percent)	
	Forecast	Actual	Forecast	Actual
U.S. (1958-\$)	854.9	839.2	4.04	5.45
U.K. (1970-t)	56.1	57.0	9.89	7.28
Germany (1962-DM)	611.6	594.0	5.73	5.70
France (1970-FF)	942.9	953.6	7.11	6.95
Netherlands (1963-NG)	91.2	90.1	7.32	7.60

Import Prices

1970 = 100

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
U.S.	90.6	93.4	100.0	105.2	113.0	134.3	198.8
U.K.	92.7	95.5	100.0	105.2	109.1	138.1	210.3
Germany	98.1	100.0	100.0	99.0	96.5	102.7	128.7
France	84.8	90.2	100.0	103.5	104.4	112.1	165.5
Netherlands	91.	93.	100.	104.	103.	111.	154.

Table 3

United States Unemployment Rate Equation
(t-statistic in parentheses)

	Stein's Results		Fourth Quarter Observations, 1954:IV - 1970:IV			
	Quarterly Observations		Modified Equation (27)		Open Economy Equation (27')	
	1960:IV - 1970:IV					
constant	3.9	(5.3)	2.4	(1.9)	1.74	(1.7)
$U(t - \delta)$	.41	(3.9)	.59	(2.8)	.75	(4.2)
$\pi(t - \delta)$	.12	(1.3)	.30	(1.9)	.27	(2.3)
$\Delta G(t - \delta)$	-.005	(1.3)	-.002	(1.1)		
$\mu(t - \delta)$	-.33	(8.8)	-.28	(3.0)	-.312	(4.3)
P_m					.145	(2.2)
e					-.022	(3.4)
S.E.	.36		.69		.52	
R^2	.9		.65		.82	
D-W	.5		1.67		2.63	

Table 4

United States Price Change Equation
(t-statistic in parentheses)

	Stein's Results		Fourth Quarter Observations, 1954:IV - 1970:IV			
	Quarterly Observations		Modified Equation (28)		Open Economy Equation (28')	
	1960:IV - 1970:IV					
constant	2.4	(4.0)	4.7	(4.0)	3.6	(3.7)
$U(t - \delta)$	-.37	(-4.4)	-.72	(-3.8)	-.56	(3.7)
$\pi(t - \delta)$	.72	(10.0)	.49	(3.4)	.46	(4.9)
$\Delta G(t - \delta)$	-0.000	(-0.6)	-.001	(-0.6)		
$\mu(t - \delta)$	.097	(3.3)	.105	(1.2)	.19*	(2.5)
p_m						
e					.014	(2.7)
S.E.	.29		.62		.43	
R^2	.96		.86		.93	
D-W	.9		2.30		2.32	

* In equation (28') $\mu(t - \delta)$ is lagged one year.

Table 5

U.S. Unemployment Rate Predictions

	Actual	Predicted Unemployment	
	<u>Unemployment</u>	<u>Modified Eqn. (27)</u>	<u>Simplified Eqn. (27')</u>
1971:IV	6.0	5.3	5.6
1972:IV	5.3	5.0	6.0
1973:IV	4.8	4.4	4.9
1974:IV	6.6	5.8	10.3

Table 6

U.S. Price Change Predictions

	Actual	Predicted Inflation	
	<u>Inflation Rate</u>	<u>Modified Eqn. (28)</u>	<u>Simplified Eqn. (28')</u>
1971:IV	3.5	3.8	4.0
1972:IV	3.7	2.7	3.3
1973:IV	7.4	3.4	4.8
1974:IV	12.0	5.5	7.2

Table 7

Netherlands Price Change Equations
(t-statistics in parentheses)

	Korteweg Results 1953-1973		New Results 1953-1971
constant	2.79	(3.34)	3.46 (4.96)
$\pi(t - \delta)$			-.30 (2.63)
$Q(t - \delta)$	-.43	(2.80)	-.37 (3.04)
$p_{Au}(t - \delta)$	1.29	(3.73)	1.44 (5.75)
$\Delta G(t - \delta)$	.14	(1.14)	.24 (2.82)
$\mu(t - \delta)$			.11 (1.94)
$\mu(t - 1 - \delta)$	.21	(2.81)	
p_m	.10	(0.95)	.25 (3.33)
e	-.02	(0.23)	
S.E.	1.21		.77
D-W	2.12		2.00
\bar{R}^2	.81		.87

Table 8

German Price Change Equation, 1953-1973
(t-statistics in parentheses)

constant	4.31	(3.66)
$U(t - \delta)$	-4.03	(5.43)
$\mu(t - \delta)$	.32	(3.45)
$e(t - \delta)$	.21	(4.06)
S.E.	1.08	
\bar{R}^2	.70	
D-W	2.18	

Table 9

Pooled Nominal Income Equations, 1951-1974
 (United States, United Kingdom, Germany, Netherlands)
 Observations are Five-Year Growth Rates*
 (t-statistics in parentheses)

	All	United States versus Others Pooled	United States versus Others Individually
	<u>Pooled</u>		
constant	27.37 (7.85)	31.03 (7.07)	16.57 (2.11)
u	.62 (7.62)	.55 (6.01)	1.00 (2.98)
^c U.S.		-14.46 (1.50)	
^u U.S.		.44 (1.18)	
^c U.K.			14.17 (1.54)
^u U.K.			-.37 (1.02)
^c G			11.57 (0.61)
^u G			-.49 (1.09)
^c N			5.67 (0.46)
^u N			-.17 (0.43)
S.E.	7.61	7.53	6.89
D-W	1.96	2.09	2.79
\bar{R}^2	.75	.76	.80
F-stat.		1.19	1.65
Crit. Value (5%)		3.63	3.00

*Except for the last periods (1971-74) which are three-year rates extrapolated to five years.

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Some International Evidence on Output-Inflation Tradeoffs

By ROBERT E. LUCAS, JR.*

This paper reports the results of an empirical study of real output-inflation tradeoffs, based on annual time-series from eighteen countries over the years 1951-67. These data are examined from the point of view of the hypothesis that average real output levels are invariant under changes in the time pattern of the rate of inflation, or that there exists a "natural rate" of real output. That is, we are concerned with the questions (i) does the natural rate theory lead to expressions of the output-inflation relationship which perform satisfactorily in an econometric sense for all, or most, of the countries in the sample, (ii) what testable restrictions does the theory impose on this relationship, and (iii) are these restrictions consistent with recent experience?

Since the term "natural rate theory" refers to varied aggregation of models and verbal developments,¹ it may be helpful to sketch the key elements of the particular version used in this paper. The first essential presumption is that *nominal* output is determined on the aggregate demand side of the economy, with the division into real output and the price level largely dependent on the behavior of *suppliers* of labor and goods. The second is that the partial "rigidities" which dominate short-run supply behavior result from suppliers' lack of information on some of the prices relevant to their decisions. The third

presumption is that inferences on these relevant, unobserved prices are made optimally (or "rationally") in light of the stochastic character of the economy.

As I have argued elsewhere (1972), theories developed along these lines will *not* place testable restrictions on the coefficients of estimated Phillips curves or other single equation expressions of the tradeoff. They will not, for example, imply that money wage changes are linked to price level changes with a unit coefficient, or that "long-run" (in the usual distributed lag sense) Phillips curves must be vertical. They *will* (as we shall see below) link supply parameters to parameters governing the stochastic nature of demand shifts. The fact that the implications of the natural rate theory come in this form suggests an attempt to test it using a sample, such as the one employed in this study, in which a wide variety of aggregate demand behavior is exhibited.

In the following section, a simple aggregative model will be constructed using the elements sketched above. Results based on this model are reported in Section II, followed by a discussion and conclusions.

I. An Economic Model

The general structure of the model developed in this section may be described very simply. First, the aggregate price-quantity observations are viewed as intersection points of an aggregate demand and an aggregate supply schedule. The former is drawn up under the assumption of a cleared money market and represents the output-price level relationship implicit in

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¹ The most useful, general statements are those of Milton Friedman (1968) and Edmund Phelps. Specific illustrative examples are provided by Donald Gordon and Allan Hynes and Lucas (April 1972).

the standard IS-LM diagram. It is viewed as being shifted by the usual set of demand-shift variables: monetary and fiscal policies and variation in export demands. The supply schedule is drawn under the assumption of a cleared labor market; its slope therefore reflects labor and product market "rigidities."

The structure of this model, which is essentially that suggested in Lucas and Leonard Rapping (1969), will be greatly simplified by an additional special assumption: that the aggregate demand curve is unit elastic.² In this case, the level of nominal output can be treated as an "exogenous" variable with respect to the goods market, and the entire burden of accounting for the breakdown of nominal income into real output and price is placed on the aggregate supply side. In the next subsection, *A*, a supply model designed to serve this purpose is developed. In subsection *B*, solutions to the full (demand and supply) model are obtained.

A. Aggregate Supply

All formulations of the natural rate theory postulate rational agents, whose decisions depend on *relative* prices only, placed in an economic setting in which they cannot distinguish relative from general price movements. Obviously, there is no limit to the number of models one can construct where agents are placed in this situation of imperfect information; the trick is to find tractable schemes with this feature. One such model is developed below.

We imagine suppliers as located in a large number of scattered, competitive markets. Demand for goods in each period

² An explicit derivation of the price-output relationship from the IS-LM framework is given by Frederic Raines. Of course, this framework does not imply an elasticity of unity, though it is consistent with it. Since the unit elasticity hypothesis is primarily a matter of convenience in the present study, I shall comment below on the probable consequences of relaxing it.

is distributed unevenly over markets, leading to relative as well as general price movements. As a consequence, the situation as perceived by individual suppliers will be quite different from the aggregate situation as seen by an outside observer. Accordingly, we shall attempt to keep these two points of view separate, turning first to the situation faced by individual suppliers.

Quantity supplied in each market will be viewed as the product of a normal (or secular) component common to all markets and a cyclical component which varies from market to market. Letting z index markets, and using y_{nt} and y_{ct} to denote the *logs* of these components, supply in market z is:

$$(1) \quad y_t(z) = y_{nt} + y_{ct}(z)$$

The secular component, reflecting capital accumulation and population change, follows the trend line:

$$(2) \quad y_{nt} = \alpha + \beta t$$

The cyclical component varies with perceived, *relative* prices and with its own lagged value:

$$(3) \quad y_{ct}(z) = \gamma [P_t(z) - E(P_t | I_t(z))] + \lambda y_{c,t-1}(z)$$

where $P_t(z)$ is the actual price in z at t and $E(P_t | I_t(z))$ is the mean current, general price level, conditioned on information available in z at t , $I_t(z)$.³ Since y_{ct} is a deviation from trend, $|\lambda| < 1$.

³ A supply function for labor which varies with the ratio of actual to expected prices is developed and verified empirically by Lucas and Rapping (1969). The effect of lagged on actual employment is also shown. In our 1972 paper, in response to Albert Rees's criticism, we found that this persistence in employment cannot be fully explained by price expectations behavior. Both these effects—an expectations and a persistence effect—will be transmitted by firms to the goods market. In addition, they are probably augmented by speculative behavior on the part of firms (as analyzed for example, by Paul Taubman and Maurice Wilkinson).

For a general equilibrium model in which suppliers behave essentially as given by (3), see my 1972 papers.

The information available to suppliers in z at t comes from two sources. First, traders enter period t with knowledge of the past course of demand shifts, of normal supply y_{nt} , and of past deviations $y_{e,t-1}$, $y_{e,t-2}$, While this information does not permit exact inference of the *log* of the current general price level, P_t , it does determine a "prior" distribution on P_t , common to traders in all markets. We assume that this distribution is known to be normal, with mean \bar{P}_t (depending in a known way on the above history) and a constant variance σ^2 .

Second, we suppose that the actual price deviates from the (geometric) economy-wide average by an amount which is distributed independently of P_t . Specifically, let the percentage deviation of the price in z from the average P_t be denoted by z (so that markets are indexed by their price deviations from average) where z is normally distributed, independent of P_t , with mean zero and variance τ^2 . Then the observed price in z , $P_t(z)$ (in *logs*) is the sum of independent, normal variates

$$(4) \quad P_t(z) = P_t + z$$

The information $I_t(z)$ relevant for estimation of the unobserved (by suppliers in z at t) P_t , consists then of the observed price $P_t(z)$ and the history summarized in \bar{P}_t .

To utilize this information, suppliers use (4) to calculate the distribution of P_t , conditional on $P_t(z)$ and \bar{P}_t . This distribution is (by straightforward calculation) normal with mean:

$$(5) \quad E(P_t | I_t(z)) = E(P_t | P_t(z), \bar{P}_t) \\ = (1 - \theta)P_t(z) + \theta\bar{P}_t$$

where $\theta = \tau^2 / (\sigma^2 + \tau^2)$, and variance $\theta\sigma^2$. Combining (1), (3), and (5) yields the supply function for market z :

$$(6) \quad y_t(z) = y_{nt} + \theta\gamma[P_t(z) - \bar{P}_t] \\ + \lambda y_{e,t-1}(z)$$

Averaging over markets (integrating with respect to the distribution of z) gives the aggregate supply function:

$$(7) \quad y_t = y_{nt} + \theta\gamma(P_t - \bar{P}_t) \\ + \lambda[y_{t-1} - y_{n,t-1}]$$

The *slope* of the aggregate supply function (7) thus varies with the fraction θ of *total* individual price variance, $\sigma^2 + \tau^2$, which is due to *relative* price variation. In cases where τ^2 is relatively small, so that individual price changes are virtually certain to reflect general price changes, the supply curve is nearly vertical. At the other extreme when general prices are stable (σ^2 is relatively small) the slope of the supply curve approaches the limiting value of γ .⁴

B. Completion and Solution of the Model

A central assumption in the development above is that supply behavior is based on the *correct* distribution of the unobserved current price level, P_t . To proceed, then, it is necessary to determine what this correct distribution is, a step which requires the completion of the model by inclusion of an aggregate demand side.

As suggested earlier, this will be done by postulating a demand function for goods of the form:

$$(8) \quad y_t + P_t = x_t$$

where x_t is an exogenous shift variable—equal to the observable *log* of nominal *GNP*. Further, let $\{\Delta x_t\}$ be a sequence of independent, normal variates with mean δ and variance σ_x^2 .⁵

⁴ This predicted relationship between a supply elasticity and the variance of a component of the price series is analogous to the link between the income elasticity of consumption demand and the variances of permanent and transitory income components which Friedman (1957) observes. As will be seen in Section II, it works in empirical testing in much the same way as well.

⁵ This particular characterization of the "shocks" to the economy is not central to the theory, but to discuss

The relevant history of the economy then consists (at most) of y_{nt} (which fixes calendar time), the demand shifts x_t , x_{t-1}, \dots , and past actual real outputs y_{t-1}, y_{t-2}, \dots . Since the model is linear in *logs*, it is reasonable to conjecture a price solution of the form:⁶

$$(9) \quad P_t = \pi_0 + \pi_1 x_t + \pi_2 x_{t-1} + \pi_3 x_{t-2} + \dots \\ + \eta_1 y_{t-1} + \eta_2 y_{t-2} + \dots + \xi_0 y_{nt}$$

Then \bar{P}_t will be the expectation of P_t , based on all information *except* x_t (the current demand level) or:

$$(10) \quad \bar{P}_t = \bar{P}_0 + \pi_1(x_{t-1} + \delta) + \pi_2 x_{t-1} \\ + \pi_3 x_{t-2} + \dots + \eta_1 y_{t-1} \\ + \eta_2 y_{t-2} + \dots + \xi_0 y_{nt}$$

To solve for the unknown parameters π_i , η_j , and ξ_0 we first eliminate y_t between (7) and (8), or equate quantity demanded and supplied. Then inserting the right sides of (9) and (10) in place of P_t and \bar{P}_t , one obtains an identity in $\{x_t\}$, $\{y_t\}$, and y_{nt} , which is then used to obtain the parameter values. The resulting solutions for price and output are:⁷

$$P_t = \frac{\theta\gamma\delta}{1 + \theta\gamma} - \lambda\beta + \frac{1}{1 + \theta\gamma} x_t$$

rational expectations formation at all, *some* explicit stochastic description is clearly required. Independence is used here partly for simplicity, partly because it is empirically roughly accurate for most countries in the sample. The effect of autocorrelation in the shocks would, as can be easily traced out, be to add higher order lag terms to the solutions found below.

⁶ This solution method is adapted from Lucas (1972), which is in turn based on the ideas of John Muth.

⁷ If a demand function of the form $y_t = \xi P_t + x_t$ had been used, these solutions would assume the same form, with different expressions for the coefficients. If $\xi \neq 1$, however, x_t is an unobserved shock, unequal in general to observed nominal income. In this case, the model still predicts the time-series structure (moments and lagged moments) of the series y_t , ΔP_t and is thus, in principle, testable. I have found empirical experimenting along these lines suggestive, but the series used are simply too short to yield results of any reliability.

$$+ \frac{\theta\gamma}{1 + \theta\gamma} x_{t-1} - \lambda y_{t-1} - (1 - \lambda) y_{nt} \\ y_t = - \frac{\theta\gamma\delta}{1 + \theta\gamma} + \lambda\beta + \frac{\theta\gamma}{1 + \theta\gamma} \Delta x_t \\ + \lambda y_{t-1} + (1 - \lambda) y_{nt}$$

In terms of ΔP_t and y_{ct} , and letting $\pi = \theta\gamma/(1 + \theta\gamma)$, the solutions are:

$$(11) \quad y_{ct} = -\pi\delta + \pi\Delta x_t + \lambda y_{c,t-1}$$

$$(12) \quad \Delta P_t = -\beta + (1 - \pi)\Delta x_t + \pi\Delta x_{t-1} \\ - \lambda\Delta y_{c,t-1}$$

Let us review these solutions for internal consistency. Evidently, P_t is normally distributed about \bar{P}_t . The conditional variance of P_t will have the constant (as assumed) variance $1/(1 + \theta\gamma)^2 \sigma_x^2$. Thus those features of the behavior of prices which were assumed "known" by suppliers in subsection *A* are, in fact, true in this economy.

To review, equations (11) and (12) are the *equilibrium values* of the inflation rate and real output (as a percentage deviation from trend). They give the intersection points of an aggregate demand schedule, shifted by changes in x_t , and an aggregate supply schedule shifted by variables (lagged prices) which determine expectations. In order to avoid the introduction of an additional, spurious "expectations parameter," one cannot solve for this intersection on a period-by-period basis; accordingly, we have adopted a method which yields equilibrium "paths" of prices and output. Otherwise, the interpretation of (11) and (12) is entirely conventional.

Not surprisingly, the solution values of inflation and the cyclical component of real output are indicated by (11) and (12) to be distributed lags of current and past changes in nominal output. A change in the nominal expansion rate, Δx_t , has an immediate effect on real output, and lagged effects which decay geometrically. The

immediate effect on prices is one minus the real output effect, with the remainder of the impact coming in the succeeding period. We note in particular that this lag pattern may well produce periods of simultaneous inflation and below average real output. Though these periods arise because of supply shifts, the shifts result from lagged perception of demand changes, and *not* from autonomous changes in the cost structure of suppliers.

In addition to these features, the model does indeed assert the existence of a natural rate of output: the *average* rate of demand expansion, δ , appears in (11) with a coefficient equal in magnitude to the coefficient of the current rate, and with the opposite sign. Thus changes in the average rate of nominal income growth will have *no* effect on average real output. On the other hand, unanticipated demand shifts do have output effects, with magnitude given by the parameter π . Since this effect depends on "fooling" suppliers (in the sense of subsection A), one expects that π will be larger the smaller the variance of the demand shifts. We next develop this implication explicitly.

From the definition of π in terms of θ and γ , and the definition of θ in terms of σ^2 and τ^2 we have

$$\pi = \frac{\tau^2 \gamma}{\sigma^2 + \tau^2(1 + \gamma)}$$

Combining with the expression for σ^2 obtained above, this gives

$$(13) \quad \pi = \frac{\tau^2 \gamma}{(1 - \pi)^2 \sigma_x^2 + \tau^2(1 + \gamma)}$$

For fixed τ^2 and γ , then, π takes the value $\gamma/(1 + \gamma)$ at $\sigma_x^2 = 0$ and tends monotonically to zero as σ_x^2 tends to infinity.

The prediction that the average deviation of output from trend, $E(y_{t-1})$, is invariant under demand policies is not, of course, subject to test: the deviations from

a *fitted* trend line must average to zero. Accordingly, we must base tests of the natural rate hypothesis (in this context) on (13): a relationship between an observable variance and a slope parameter.

II. Test Results

Testing the hypothesis advanced above involves two steps. First, within each country (11) and (12) should perform reasonably well. In particular, under the presumption that demand fluctuations are the major source of variation in ΔP_t and y_{t-1} , the fits should be "good." The estimated values of π and λ should be between zero and one. Finally, since (11) and (12) involve five slope parameters but only two theoretical ones, the estimated π and λ values obtained from fitting (11) should work reasonably well in explaining variations in ΔP_t .

The main object of this study, however, is not to "explain" output and price level movements within a given country, but rather to see whether the terms of the output-inflation "tradeoff" vary across countries in the way predicted by the natural rate theory. For this purpose, we shall utilize the theoretical relationship (13) and the estimated values of π and σ_x^2 . Under the assumption that τ^2 and γ are relatively stable across countries, the estimated π values should decline as the sample variance of Δx_t increases.

Descriptive statistics for the eighteen countries in the sample are given in Table 1.⁸ As is evident, there is no association

⁸ The raw data on real and nominal GNP are from *Yearbook of National Accounts Statistics*, where series from many countries are collected and put on a uniform basis. The choice of countries is by no means random: the eighteen used are all the countries from which continuous series are available. The sample could thus be broadened considerably by use of sources from individual countries. To obtain the variables used in the tests, the *logs* of real and nominal output, y_t and x_t , are *logs* of the series in the source. The *log* of the price level, P_t , is the difference $x_t - y_t$; y_{t-1} is the residual from the trend line $y_t = a + bt$, fit by least squares from the sample

TABLE 1—DESCRIPTIVE STATISTICS, 1952-67

Country	Mean Δy_t	Mean ΔP_t	Variance y_{t-1}	Variance ΔP_t	Variance Δx_t
Argentina	.026	.220	.00096	.01998	.01555
Austria	.048	.038	.00104	.00113	.00124
Belgium	.034	.021	.00075	.00033	.00072
Canada	.043	.024	.00109	.00018	.00139
Denmark	.039	.041	.00082	.00038	.00084
West Germany	.056	.026	.00147	.00026	.00073
Guatemala	.046	.004	.00111	.00079	.00096
Honduras	.044	.012	.00042	.00084	.00109
Ireland	.025	.038	.00139	.00060	.00111
Italy	.053	.032	.00022	.00044	.00040
Netherlands	.047	.036	.00055	.00043	.00101
Norway	.038	.034	.00092	.00033	.00098
Paraguay	.054	.157	.00488	.03192	.03450
Puerto Rico	.058	.024	.00205	.00021	.00077
Sweden	.039	.036	.00030	.00043	.00041
United Kingdom	.028	.034	.00022	.00037	.00014
United States	.036	.019	.00105	.00007	.00064
Venezuela	.060	.016	.00175	.00068	.00127

between average real growth rates and average rates of inflation: this fact seems to be consistent with both the conventional and natural rate views of the tradeoff. Since our interest is in comparing real output and price behavior under different time patterns of nominal income, these statistics are somewhat disappointing. Essentially two types of nominal income behavior are observed: the highly volatile and expansive policies of Argentina and Paraguay, and the relatively smooth and moderately expansive policies of the remaining sixteen countries. But if the sample provides only two "points," they are indeed widely separated: the estimated variance of demand in the high inflation countries is on the order of 10 times that in the stable price countries.

The first three columns of Table 2 summarize the performance of equation (11) in accounting for movements in y_{t-1} . The estimated values for π all lie between zero and one; with the exceptions of Argentina

period. The moments given in Table 1 are maximum likelihood estimates based on these series. The estimates reported in Table 2 are by ordinary least squares.

and Puerto Rico, so do the estimated λ values. The R^2 s indicate that for many, or perhaps most countries, important output-determining variables have been omitted from the model. The R^2 s for the inflation rate equation, (12), are given in column (4) of Table 2. In general, these tend to be lower than for equation (11), and not surprisingly the estimated coefficients from (12) (which are not shown) tend to behave erratically. Column (5) of Table 2 gives the fraction of the variance of ΔP_t explained by (12) when the coefficient estimates from (11) are imposed. (A "-" indicates a negative value.)⁹

With respect to its performance as an intracountry model of income and price determination, then, the system (11)-(12) passes the formal tests of significance. On the other hand, the goodness-of-fit statis-

⁹ The loss of explanatory power when these coefficients are imposed on (12) can be assessed formally by an approximate Chi-square test. By this measure, the loss is significant at the .05 level for Paraguay only. As Table 2 shows, however, this test is somewhat deceptive: for several countries the least squares estimates of (12) are so poor that there is little explanatory power to lose, and the test is "passed" vacuously.

TABLE 2—SUMMARY STATISTICS BY COUNTRY, 1953-67

Country	π	λ	R_v^2	$R_{\Delta P}^2$	R_w^2
Argentina	.011 (.070)	-.126 (.258)	.018	.929	.914
Austria	.319 (.179)	.703 (.209)	.507	.518	—
Belgium	.502 (.100)	.741 (.093)	.875	.772	.661
Canada	.759 (.064)	.736 (.075)	.936	.418	—
Denmark	.571 (.118)	.679 (.110)	.812	.498	.282
West Germany	.820 (.136)	.784 (.110)	.881	.130	—
Guatemala	.674 (.301)	.695 (.274)	.356	.016	—
Honduras	.287 (.152)	.414 (.250)	.274	.521	.358
Ireland	.430 (.121)	.858 (.111)	.847	.499	.192
Italy	.622 (.134)	.042 (.183)	.746	.934	.914
Netherlands	.531 (.111)	.571 (.149)	.711	.627	.580
Norway	.530 (.088)	.841 (.096)	.893	.633	.427
Paraguay	.022 (.079)	.742 (.201)	.568	.941	.751
Puerto Rico	.689 (.121)	1.029 (.072)	.939	.419	—
Sweden	.287 (.166)	.584 (.186)	.525	.648	.405
United Kingdom	.665 (.290)	.178 (.209)	.394	.266	.115
United States	.910 (.086)	.887 (.070)	.945	.571	.464
Venezuela	.514 (.183)	.937 (.148)	.755	.425	—

tics are generally considerably poorer than we have come to expect from annual time-series models.

In contrast to these somewhat mixed results, the behavior of the estimated π values across countries is in striking conformity with the natural rate hypothesis. For the sixteen stable price countries, π ranges from .287 to .910; for the two volatile price countries, this estimate is smaller by a factor of 10! To illustrate this order-of-magnitude effect more sharply, let us examine the complete results for two countries: the United States and Argen-

tina. For the United States, the fitted versions of (11) and (12) are:

$$y_{r,t} = -.049 + (.910)\Delta x_t + (.887)y_{r,t-1}$$

$$\Delta P_t = -.028 + (.119)\Delta x_t + (.758)\Delta x_{t-1} - (.637)\Delta y_{r,t-1}$$

The comparable results for Argentina are:

$$y_{r,t} = -.006 + (.011)\Delta x_t - (.126)y_{r,t-1}$$

$$\Delta P_t = -.047 + (1.140)\Delta x_t - (.083)\Delta x_{t-1} + (.102)\Delta y_{r,t-1}$$

In a stable price country like the United States, then, policies which increase nomi-

nal income tend to have a large initial effect on real output, together with a small, positive initial effect on the rate of inflation. Thus the apparent short-term tradeoff is favorable, as long as it remains unused. In contrast, in a volatile price country like Argentina, nominal income changes are associated with equal, contemporaneous price movements with no discernible effect on real output. These results are, of course, inconsistent with the existence of even moderately stable Phillips curves. On the other hand, they follow directly from the view that inflation stimulates real output if, and only if, it succeeds in "fooling" suppliers of labor and goods into thinking *relative* prices are moving in their favor.

III. Concluding Remarks

The basic idea underlying the tests reported above is extremely simple, yet I am afraid it may have become obscured by the rather special model in which it is embodied. In this section, I shall try to restate this idea in a way which, though not quite accurate enough to form the basis for econometric work, conveys its essential feature more directly.

The propositions to be compared empirically refer to the effects of aggregate demand policies which tend to move inflation rates and output (relative to trend) in the same direction, or alternatively, unemployment and inflation in opposite directions. The conventional Phillips curve account of this observed co-movement says that the terms of the tradeoff arise from relatively stable structural features of the economy, and are thus independent of the nature of the aggregate demand policy pursued. The alternative explanation of the same observed tradeoff is that the positive association of price changes and output arises because suppliers misinterpret general price movements for relative price changes. It follows from this view,

first, that changes in average inflation rates will not increase average output, and secondly, that the higher the *variance* in average prices, the less "favorable" will be the observed tradeoff.

The most natural cross-national comparison of these propositions would seem to be a direct examination of the association of average inflation rates and average output, relative to "normal" or "full employment." Unfortunately, there seems to be no satisfactory way to measure normal output. The deviation-from-fitted-trend method I have used *defines* normal output to be average output. The use of unemployment series suffers from the same difficulty, since one must somehow select the (obviously positive) rate to be denoted full employment.

Thus although the issue revolves around the relation between *means* of inflation and output rates, it cannot be resolved by examination of sample averages. Fortunately, the existence of a stable tradeoff also implies a relationship between *variances* of inflation and output rates, as illustrated in Figure 1. With a stable tradeoff, policies which lead to wide variation in prices must also induce comparable variation in real output. If these sample variances do not tend to move together (and, as Table 1 shows, they do not) one

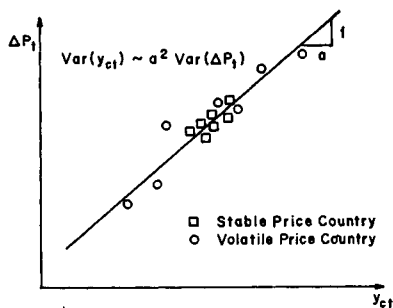


FIGURE 1

can only conclude that the tradeoff tends to fade away the more frequently it is used, or abused.

This simple argument leads to a formal test if the output-inflation association is entirely contemporaneous. In fact, however, it involves lagged effects which make a direct comparison of variances, as just suggested, difficult in short time-series. Accordingly, it has been necessary to impose a specific, simple structure on the data. As we have seen, this structure accounts for output and inflation rate movements only moderately well, but well enough to capture the main phenomenon predicted by the natural rate theory: the higher the variance of demand, the more unfavorable are the terms of the Phillips tradeoff.

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Mr. NEAL. Dr. Pierce, I just asked Dr. Meltzer if he found any problems with the chart. I know you've had the opportunity to see it before. Do you have any comments?

Dr. PIERCE. Well, I guess not, really. Charts are simple things, and they have to leave out a lot of complexity, but the relationship is there. However, one thing that has always bothered me is that if one shifts two charts around long enough, maybe he can make them match up, and the question is has one really unearthed an underlying behavioral relationship in the economy or has he simply fooled around long enough until he has found the appropriate pairing.

I guess my instincts and experience say it is a combination of the two. There is a great deal of empirical evidence that says that there's a relationship between monetary policy and inflation, and that's borne out by the chart. There's also a great deal of evidence in the statistical literature which says that economic time series tend to have steady patterns in their behavior, so-called serial correlation in them, and that two series can appear to be related even though behaviorally they are not. I think there is some of that problem in that chart.

But I would have to say that the chart dramatizes something that is very important to dramatize. There is a relationship between monetary policy and inflation.

All I would counsel you against doing is inferring that every time there is an expansion in money growth, that as night follows day we are going to have inflation 2 years from now. I don't know of any empirical evidence that allows one to make that assertion, because all we have is average relationships. On the average, the economy tends to be fairly highly employed, and if the economy is fairly highly employed and we have an expansion in monetary policy, then the only place that that increase in demand in the economy can go is in terms of bidding up prices. So, on average, there should be a relationship between accelerations in money growth and acceleration in prices, with a lag, because the economy tends toward full employment.

When the economy is not fully employed, then it doesn't follow that if we have a relatively rapid money growth for, say, two quarters, if we wait 2 years, we will observe prices going up. I reject that proposition theoretically and I reject it empirically. The important lesson is, though, don't keep it up.

Mr. NEAL. Well, let me ask this question. Why raise it to any significant degree at all?

Dr. PIERCE. Well, because monetary policy has two effects. It affects prices, indeed, but it also affects production and employment in the economy. And if production and employment are depressed, then monetary policy can have an effect of increasing production and employment in the economy. And the point I would make is so long as there is a substantial amount of idle resources, that those resources can be brought back to work without a large impact on inflation provided that that stimulus is not continued after the economy becomes more fully employed.

But it is because you're trying to employ the economy. If the economy is always fully employed, then there's no reason. If we could ever get to what economists call equilibrium, and the economy was going along at a nice steady rate, then there's every reason to believe that money ought to grow at a steady rate. There'd be no reason to deviate.

Mr. NEAL. Well, let me ask—

Dr. MELTZER. We ought to pursue that a little more.

Mr. NEAL. I do want to pursue that.

Last year was probably a pretty good example. The economy was very poorly employed, and your recommendation might have been to expand the money supply.

Now, it's my understanding that money growth has been adequate recently, say, since we passed H. Con. Res. 133. Now if you increase the money supply, you're going to add to the pool of money available.

Dr. PIERCE. Right.

Mr. NEAL. Why would you add to the pool of money supply at this time?

Dr. PIERCE. Well, I'm not sure that right now I would counsel a rapid money growth. The reason I and some other people were counseling it several months ago is that the economy was badly depressed. We made the mistake of basing our recommendations on past relationships in which it looked as though if we were going to get a 7-percent or greater growth in real output, we were going to need a relatively rapid growth in the money stock. Now, for once, the fates were kind to us—to the economy, not to the people making these recommendations—and it turned out that it was possible to finance a fairly rapid expansion without a very rapid money growth.

My reaction to that, after the fact, is fine. What I wanted to see occur was a brisk recovery and it was accomplished. Recommendations were made concerning correct Government policy, they turned out to be in error. But that's one of the reasons that one looks not just at the money stock in the short run. The economy was throwing off information in terms of declining interest rates during the recovery that not so much money growth was required. So it was possible to have the expansion in the economy, declining interest rates and not very rapid money growth. As soon as that information came in, along with some others, then some people were led to say, well, that initial prescription was wrong, we don't need as much money growth as we thought.

And in trying to interpret short-run behavior of the economy, I think it is a mistake to just look at one variable. A short-run situation is too hard to interpret. If we're trying to interpret the sweep of history, then one can do an awful lot of simplification. One can say that in every case we know of, if there's rapid money growth over a decade, you'll get inflation over that decade. And so you don't have to know a lot of the complexities. But if you're trying to give a prescription for the next 2 months or the next two calendar quarters, then you have to know more.

Now, there are uncertainties and there are potential errors in short-term policymaking. Some people would say it's not worth trying to do somewhat better by having more rapid money growth for a while. Just stick to a steady path. And that may imply that the economy won't expand quite as rapidly as you would want, but it will prevent errors on the other side being made of keeping the expansionary policy going too long, and I think that argument has merit.

My reaction in 1975 was that the economy was so depressed that it was worth having a somewhat more rapid money growth for two or three calendar quarters than a constant rate. But I certainly was

never one of these people who said we ought to have a 15-percent money growth for 2 years and let's see what happens. I think that would not be good advice.

Dr. MELTZER. May I just take up some of that issue?

Mr. NEAL. Sure. But first, I want to ask one more question.

That is, at that time, wasn't there an ample pool of money in the economy?

Dr. PIERCE. Well, I never know how to react to questions of that sort. I don't know what "ample" means.

Mr. NEAL. Well, more money relative to the demand for it, I would say.

Dr. PIERCE. Well, yes, it turned out that that was the case, based in part on the evidence of declining interest rates. The only way that the public could be made to hold increased money balances was with declining interest rates. So it was ample in that sense.

The more general issue is, was money growth ample relative to what one is trying to accomplish. If one is trying to accomplish deceleration in inflation rates as rapidly as possible, then it was probably over ample. If one's trying to accomplish as rapid a recovery as possible, it wasn't ample enough. So you really can't put much meaning on terms like "ample" until one says what he's trying to accomplish with the given monetary policy. It appears after the fact that the monetary policy was a fairly good one. Before the fact if someone had said we're going to have a 3-percent growth of money during the early stages of recovery, people would have screamed. But it turned out to have worked. But it still wasn't the right policy to recommend ahead of time. It just happened to work out that time.

Mr. NEAL. Yes, sir.

Dr. MELTZER. I'd like to separate out several issues that have come up in the last few minutes. One is the question of looking at one variable. I don't think that any serious economist argues that you should only look at the money stock or the growth rate of money stock for all purposes; there is capital, there's labor, there's the rate at which people come into the labor force, there are many variables important for judging what the near term prospect of the economy is.

What seems to me to be much more important is to think about the problem as it occurs. As we look at the economy, there's always room, ample room for doubt about what is going to happen. When we look back at those charts, things seem crystal clear. That's the nature of the problem that we face. Things are much easier to see with hindsight than they are with foresight. In many cases our problem is that we economists are trying to offer advice, prescriptions, that are beyond what we can reasonably expect to deliver. That is how we get into many of our problems. We try to do more than we reasonably can do or know how to do.

We can improve the performance of economy. Perhaps we have improved the performance of the economy to some extent over the post-war period. But most of what we can do is give advice that is useful for the average of the year or for the average of the next 2 years. That's the kind of advice that we can reasonably be expected to give. Recommendations that say, try to keep the money supply growing at a relatively constant rate don't mean that it should grow at 3 percent per year, hour by hour, minute by minute, but that it ought to stay between 2 and 4 percent, a little bit faster during

periods when the economy is slack and a little bit slower during the period in which the economy is inflating. That is the kind of thing that an economist can reasonably expect to do. To go back to an earlier question of yours and I believe of Mr. Hannaford's, if we had done that in 1965, we would not have experienced many of the problems in the economy that we have experienced since that time. We would not have had to devalue the dollar; we would not have had a great many of the effects that we experienced because of the effects of devaluation on domestic prices, particularly commodity prices and farm prices. We might have avoided some of the worst features of the OPEC cartel because the cartel, in part, was a response to the fact that the real price paid for oil fell during the sixties.

Why did we not stabilize in 1964 or 1965 or 1966? The answer is because we were too ambitious. We thought we could run the economy and avoid the kinds of problems that we ultimately ran into. That was a bad forecast. Many of the errors that we have made since that time have been the result of similar bad forecasts. We are, I think, a more chastened breed now. We ought not to make the kinds of forecasts now that we made 10 years ago, and that some people made last year, which called for very, very stimulative policies based upon a model that is not capable of bearing the burden that is placed upon it.

The best example I can offer, and I will close with that, is to look at the error we would have made if we had followed the advice of people who said let us have 16 percent growth rate in the money stock in 1975 on the basis of extrapolating responses from previous work that they had done. We would now be experiencing an inflation rate substantially higher than the 5 to 6 percent that we are currently experiencing and we would be faced with the problem that we were faced with in 1973 and 1974.

Mr. NEAL. Excuse me, Dr. Meltzer, I have got to go catch this vote. I am sorry I have to leave at this point. I really do want to thank you both for appearing before the subcommittee.

We are going to continue these hearings, and any advice you have for us as time goes along would certainly be appreciated.

Thank you again.

[Additional material supplied for the record by Chairman Neal follows:]

[From U.S. News & World Report, May 17, 1976]

WHERE THE ECONOMY GOES FROM HERE

INTERVIEW WITH ARTHUR F. BURNS, CHAIRMAN OF THE FEDERAL RESERVE BOARD

Question. Dr. Burns, where does the economy of this country go from here?

Answer. If we have learned our lessons, an era of lasting prosperity is in prospect.

Loose financial practices prevailed in our country from about 1965 through 1973 and into 1974. We first had speculation in corporate take-overs; then speculation in the stock market; later still, heavy speculation in the real-estate market and, finally, speculation in inventories. And these speculative waves were partly overlapping.

During this period, inflation got out of control, and a deep recession inevitably followed. We're all, I think, a little wiser now than before. We realize that the basic source of our inflationary problem was the tendency of the Federal Government to run large deficits, year in and year out. And we know that as a result of this lack of financial discipline, the strength of our economy was undermined and that a severe recession occurred.

We now know that the business cycle is still very much with us; that fine tuning of the economy is as yet an unattainable goal; that recessions are an ever-present danger, and that a return to rapid inflation—if we allow that to happen—will bring on new economic trouble, perhaps even greater trouble than we've gone through recently. I see a mood spreading in our country to avoid this kind of experience.

The Congress is now following new budgetary procedures. I think this is one of the most promising developments that we've had in our country in a long while. There also is a mood in the Congress at the present time to experiment with zero-base budgeting. That would be a very salutary step to take, and I believe it will be taken before long.

We at the Federal Reserve are pursuing a moderate course of monetary policy. We're firmly resolved not to permit money and credit to expand at a rate that might release a new wave of inflation. Let there be no doubt about that.

A new mood is also spreading among private citizens. Our business people, our bankers, even our trade-union leaders have learned a lesson. The recovery of our economy is moving along in balanced fashion.

If we avoid the temptation to overstimulate the economy; if we realize—as many people now do—that the current economic expansion has developed a momentum of its own; if we avoid any further governmental stimulation at this time and prepare to apply some governmental restraint later on; if we keep all that in mind, we may move into an era of lasting prosperity—an era that this country deserves.

Question. How much danger is there that inflation will get out of hand again this year or next?

Answer. I don't think there's much danger this year, but we'd better watch our step next year.

Question. What do you mean?

Answer. Industrial raw-material prices have been advancing fairly briskly for well over a year. And if you put aside erratic items such as foodstuffs and fuel, we find that wholesale prices and consumer prices generally have been rising fairly steadily at an annual rate of about 6 or 7 percent since the middle of last year.

Moreover, wage increases are still proceeding at a pace well above the rate of increase in productivity. Some new collective-bargaining settlements are being made with cost increases that average approximately 10 percent at an annual rate.

With wage costs rising and the economy continuing to advance, there is a fair chance that price increases will multiply and we may have trouble on the inflation front in 1977.

Question. Do federal deficits contribute to the danger of inflation?

Answer. With the economic advance gathering momentum, the Federal Government, unless it gets the budget deficit down sharply, will be adding to the inflationary danger.

What we have to do is to reduce the deficit, and we must also keep the growth of money and credit at a moderate rate. That is the way to return to general price stability. Unless we do that, inflationary expectations may worsen, and our country would be headed for new and perhaps more serious trouble than we've yet had.

Question. Do you mean another recession?

Answer. Yes. If we were to return to double-digit inflation, that recession could be more severe than the one we've just gone through.

Question. Is there a chance that the recovery will be halted because the Federal Reserve is restraining the availability of money and letting interest rates go up?

Answer. We're not restraining the availability of money. Pay no attention to that kind of talk. The country is awash with liquidity.

You know, all this talk about the growth of money misses the point that what is important about money, particularly in the short run, is the willingness to use it—not the size of the stock of money or the rate at which the stock is growing.

Question. What's holding that back?

Answer. With confidence returning, nothing is holding back the willingness to use money.

In fact, the turnover of existing money balances has been moving up at an extraordinary pace. We've been able to finance a rapid economic expansion, along with declining interest rates, with only a modest rate of growth of the money supply. The basic reason is that confidence has returned. People are feeling better about their future prospects and, therefore, are using their existing cash balances more freely.

Question. Is that true for corporations as well as individuals?

Answer. Sure. We all live in the same world.

Question. And you're afraid that a return to double-digit inflation would destroy this confidence?

Answer. I don't think there is any doubt about that. Look at our own experience in 1973 and 1974. Look at Great Britain and Italy today.

The three major countries that, by and large, have had the best economic performance in the postwar period are the United States, Germany and Japan. And the average inflation rate in these countries has been lower than in most of the rest of the world.

Question. Many economists say the U.S. has a built-in inflation of around 5 or 6 percent a year. Do you agree with that?

Answer. I might set the figure a little higher than that—but, in any event, the inflationary bias in our economy can and must be corrected.

Question. What should we be looking for in trying to figure out whether this recovery will run beyond mid-1977?

Answer. We should be thinking of economic balance. The recovery thus far has been well balanced except for a lag in business-capital investment, but there are increasing signs that business-capital investment will experience a significant expansion before this year is over.

We should be watching inventories. If inventories begin increasing rapidly relative to sales, that could be a sign of trouble for the future.

We should certainly be watching the relation between costs of production and prices. If we see the rate of inflation quickening, we should anticipate trouble a year or two down the road.

If we see consumer credit expanding at a rate that is well above average, that may be a sign that consumer spending particularly for durable goods, will turn sluggish before long.

In short, we have to watch numerous indicators and try to judge whether reasonable balance is being maintained among the major economic factors.

Question. How do you as an economist decide whether any major segment of the economy is getting out of balance?

Answer. Well, being a student of the business cycle, I've made a study of historical patterns: what the typical experience has been during previous business-cycle expansions. If the economy is deviating fairly significantly from those norms, that gives me some clue to the future.

Question. Is there a minimum rate of inflation which is sustainable over a very long period of time?

Answer. I doubt it. We should aim at price stability—that is, a zero rate of inflation. If we set as our goal a rate of inflation of 2 per cent or 3 per cent a year, as some have suggested, we will exceed that figure and get into trouble again.

Question. Is it politically possible to put an end to inflation altogether?

Answer. I think we should strive for it.

Question. Would some form of guidelines or incomes policy be helpful in fighting inflation?

Answer. I would not like to see a return to mandatory price and wage controls. They rarely work well, even for a short period, and they never work well for a long period.

I would, however, be inclined to breathe a little more life into the present Council on Wage and Price Stability by giving it the authority to delay proposed price and wage increases for a short period—perhaps 30 to 45 days.

I would hope that such a Council would limit its activity to price and wage increases in key industries. It could hold public hearings, make recommendations and follow them up to see if they're being observed. But it should not go beyond that.

Question. Wouldn't mandatory wage-price controls be the next step?

Answer. I would consider that a very long step. We don't have to take it, I wouldn't want to take it, and I hope we never take it.

Question. What's the real obstacle to getting rid of inflation?

Answer. I think it's mainly a political and psychological problem. The main source of inflation is the tendency of modern governments to expand their outlays at a rapid rate in response to incessant demands from the electorate.

Governments nowadays try to solve almost every economic and social ill by spending money. With expenditures increasing faster than revenues, our own Government has been persistently paying out a great deal more to the public than it takes in from the public by way of taxes.

In the past 10 years, including the fiscal year that is just coming to a close, the accumulated deficit under the unified budget comes to something like 220 billion dollars. If you add in the off-budget outlays and the outlays of Government-sponsored enterprises, as I think you should, the accumulated deficit comes to about 300 billion dollars.

This has been the main cause of our inflation since the mid-60s.

Question. What happened to the idea that these massive deficits would soak up all the available capital in the country and make it difficult for business to finance needed investments in new plant and equipment?

Answer. That's an unfinished story.

The demand for bank credit by private enterprises diminished during the past year. A lot of business corporations permitted their inventories to run down; their profits, meanwhile, were improving.

Furthermore, they were able to borrow substantial sums in the capital market and to float stock issues in large volume. So the pressure for bank loans that many people expected did not develop.

With the economy continuing to expand and with the Federal Government still running a huge deficit—having to borrow almost as much this calendar year as it borrowed in 1975—there could be some “crowding out” before long. The best way to avoid that, or to minimize this danger, is to reduce the budget deficit sharply.

Question. Has the Federal Reserve taken steps to tighten credit?

Answer. We have modified our monetary-growth targets very slightly.

However, I have no way of knowing whether the money supply will increase less rapidly in the months ahead than in the preceding months. What the Federal Reserve has indicated is simply this: The recovery has now been running for a full year. We're looking ahead to another full year of expansion, and a slight reduction in the rate of growth of the money supply would thus be logical. Whether that will actually occur or not is still uncertain. Our projections for the monetary aggregates are specified as ranges. Over much of the past year, we've been well below the lower limit of the range. It is hard to say where we will be three months from now or a year from now.

Contrary to widespread opinion, our control over the money supply is quite limited over short periods.

Question. We get the impression from bankers that there is plenty of money for loans. Is that the way you see it?

Answer. I would agree with that. As I've said, this country is awash with liquidity.

Question. When you announced a slightly lower money targets for the Federal Reserve, you added that “further downward adjustments will be needed.” Does that mean we can look for slower monetary growth and higher interest rates later this year?

Answer. What I had in mind is that if we're ever to regain general price stability in our country, the rate of growth in currency and demand deposits, instead of being in the 4½ to 7 percent zone, will eventually have to come down to something like 1 or 2 percent a year. That is something we should strive for, not this year but gradually over the next few years.

Question. Would you say the bond market found your policy statement reassuring?

Answer. Yes. They're sensible people.

They regard the Federal Reserve as a thoroughly responsible institution. They know that we will act cautiously, and that nothing we have said or done threatens the stability of the bond market.

Question. Does your policy imply that short-term interest rates have seen their lows for the foreseeable future?

Answer. Not necessarily. We have merely signaled an intention to pursue a monetary policy that will prevent any re-igniting of inflationary fires in this country.

WHY INTEREST RATES COULD FALL

Question. Are higher interest rates to be expected as the recovery progresses?

Answer. All that I can tell you is that, historically, interest rates have moved with the business cycle, tending to rise during periods of business-cycle expansion and to decline during periods of business-cycle contraction.

Experience thus far in the present upswing of the economy has been unusual. Interest rates, instead of rising, have actually come down during the past year.

As for the future, I would not venture a prediction. But I would not lose sight of the fact that history has something to teach us. Nor would I lose sight of the fact that recent experience, which deviates from historical patterns, also has something to teach us. Actually, I think that once people become fairly convinced that the rate of inflation not only has come down but is going to stay down—once this conviction spreads and grows among the people—very powerful forces making for lower interest rates will come into being particularly in the long-term market.

Question. Are fiscal and monetary restraint all that is needed to curb inflation, or are there other things that ought to be done?

Answer. There is also a range of structural policies that we need to follow. Far too much attention is given to monetary and fiscal policies, while structural policies are neglected.

Question. What kind of policies are you talking about?

Answer. The concept is very broad. Let me give you a few examples. First of all, we need to improve productivity in our country. The trend of productivity has flattened out, partly because people aren't working as hard as they used to.

Question. How can that be improved?

Answer. One way of improving the trend of productivity is to stimulate greater investment in modern equipment. More modern facilities will help to enlarge the output per man-hour.

As for getting people to work harder, there are habits that will have to be changed. We still have featherbedding in many industries. Absenteeism has been increasing. So have the number of holidays and the length of vacations, the frequency of coffee breaks and their duration. These are habits that can be changed.

"SLOW THE PACE" OF COSTLY PROGRAMS

Question. In addition to greater productivity, what other changes are needed?

Answer. Environmental and safety programs have been pushed very intensively in the last few years, and they've been running up costs in numerous industries. Without giving up our environmental and safety objectives, we can slow down the pace at which we expect progress in those areas.

Next, we ought to try to increase employment and reduce unemployment by changing some of our labor-market policies and not rely so heavily on expansionary fiscal or monetary policies.

Question. What do you have in mind there?

Answer. One way would be to cut back on our unemployment-insurance programs. They've become too liberal. Many people now are able to draw unemployment insurance for a period of 65 weeks. Such a long duration tends to increase the unemployment rate, as various studies have indicated.

Moreover the minimum wage ought to be reduced for teen-agers, many of whom are being priced out of the labor market.

We didn't have a serious teen-age unemployment problem before the federal minimum wage was enacted. Japan doesn't have any teen-age unemployment problem now. In Japan, youngsters are underpaid relative to their productivity, and therefore the demand for teen-age labor exceeds the supply. In our country, we have just the reverse.

We've also talked for years about establishing computerized job banks, so that the labor market would be better organized and fractional unemployment could be reduced. But we haven't done this on the scale that modern technology makes possible.

Question. Should the Federal Government hire the unemployed?

Answer. Well, if it were to do it my way—

Question. What's your plan?

Answer. You know, we've had debates for many years about what rate of unemployment corresponds to full employment, and all kinds of numbers are bandied about. To my mind, we as a nation should be aiming literally at a zero rate of involuntary unemployment. To accomplish this, besides encouraging private enterprise and investment, the Federal Government may need to serve as the employer of last resort.

The wage paid by the Government, however, should not be so attractive as to blunt incentives to find a job in private industry. The wage that would be appropriate for this purpose, I think, must be somewhat below the minimum wage.

I say that because we have something like 7 million people in our country who, at the present time, are working in the private sector at a wage equal to or below the minimum. If the Federal Government, acting as the employer of last resort,

were to pay more than the minimum wage, there could be a large exodus of individuals from private employment into governmental work. That, I think, would weaken private industry and burden the Government and taxpayers unduly.

Question. Does your concept envision taking many people off relief and forcing them to take jobs?

Answer. Yes, it does. And it also calls for reducing drastically the length of time that an individual could draw unemployment insurance. I've suggested a period of 13 weeks.

Question. Is the country ready for that?

Answer. No, I don't think it is. Conservatives are afraid of it because they fear that reliance upon Government would become even greater than it is at the present time, and that budget expenditures would grow if such a responsibility were assumed by the Federal Government. Liberals are opposed to my scheme because they would like to have the Government pay prevailing wages, or something close to that.

However, I wouldn't be surprised if a plan such as mine received increasing support 5 years from now or 10 years from now or 20 years from now.

The character of our society has changed. Ours is now an urban society. Very few of us have folks back on the farm with whom we could stay and live for a while. And family life is no longer as close, as intimate, as it once was. People live preponderantly in cities, and many lead lonely lives.

When an economic society reaches a state such as that, the Government—in the interest of the general welfare and in the interest also of economic and political stability—should seriously consider undertaking the responsibility of becoming an employer of last resort.

It should do so, however, in a manner that will respect free private enterprise and in a manner that will not burden the federal budget.

I think if my scheme were applied, the added cost to the Government might well be nil, because there would be large savings in welfare payments, unemployment-insurance payments and the like.

Question. Is it possible that your scheme would eventually run out of control as Congress came under pressure to raise the wages for these Government jobs?

Answer. Yes, there is. The wage paid by the Federal Government might be below the minimum at first, but then be increased year after year through congressional action. Congress has been known to do things like that. Conservatives fear this, and rightly so.

To prevent such a "development," we might need a constitutional amendment providing that, when the Government is acting as an employer of last resort, this special wage would be linked irrevocably to the minimum wage.

ENERGY PLANS: BIG TALK, LITTLE RESULT

Question. Dr. Burns, do you think the U.S. still needs to worry about an energy problem?

Answer. I think this country has a very serious long-range energy problem. We've talked a great deal about energy independence, but we've done very little about it.

As things stand now, this country is at the mercy of what a few foreign countries may decide to do about the price of oil or about the amount of oil they are willing to sell us. Our dependence on oil imports is growing, while our production of oil and natural gas is declining. We are enjoying ourselves once again without worrying about queues at the gasoline stations.

Question. Would you favor imposing quotas to hold down our imports of oil?

Answer. I wouldn't favor quotas, but I would favor building up our energy resources. And I would favor businesslike negotiations at the financial, economic and political level with the oil-producing countries in the Middle East and elsewhere.

I don't think we can count on being secure, militarily or economically, unless we attend to the energy problem.

Question. How can we build up our energy resources?

Answer. I'm not an expert in this area. But we have enormous amounts of coal available. Also, other countries in the world are making faster progress in utilizing nuclear power than we are. And there are all kinds of sophisticated new energy possibilities.

I think we've got to take our chances with new technology and be willing to make some investment in it.

Question. Should the Federal Government subsidize such development along the lines of Vice President Nelson Rockefeller's plan, which would establish a 100-billion-dollar federal corporation?

Answer. I would be willing to subsidize it, yes, but not on the scale suggested by Mr. Rockefeller.

And I certainly would want to finance any subsidy through the regular budget and avoid off-budget financing, which, I believe, was a part of the scheme originally advocated by the Administration.

Question. Are you concerned about the impact on our trade balance of the rising oil imports?

Answer. Fortunately, the position of the dollar is very strong at present. I think we can reasonably count on its remaining strong for some time, but not indefinitely.

If our imports of oil should continue to rise rapidly, as will happen if we continue to be careless in our use of oil, that could well leave its mark eventually on the value of the dollar in exchange markets.

Question. What, if anything, should be done to make more funds available to industry for capital investment?

Answer. I think that changes in tax policy could be very helpful. We tax our corporations more heavily than many countries around the world.

I would like to see the corporate income-tax rate reduced, the capital-gains tax reduced, and double taxation of dividends diminished. Measures of this sort, I think, would be helpful in stimulating capital investment.

Question. Should ordinary individual income taxes be reduced?

Answer. I'd like to see all kinds of taxes reduced, but we can reduce taxes responsibly only if we reduce Government spending.

Question. Dr. Burns, are the nation's banks stronger today than they were during the recession?

Answer. It's undoubtedly true that during the early 1970s many of our banks, particularly the large banks, shared in the euphoria that spread through the business community. I went to Honolulu in October, 1974, and lectured the American Bankers Association on some of the carelessness that had crept into banking practices.

I must say that within the past year and a half, I have found no need to lecture the bankers. They have mended their ways. We have better management in our banks now than we've had in some years. The bankers have learned their lesson.

Banks around the country have improved their liquidity position dramatically within the past year. Their reliance on volatile funds has diminished. Their capital position has improved. They've put aside huge sums in the form of reserves to cover loan losses. And in spite of that, their profits in 1975 were somewhat larger than during 1974.

So our banking system is sound, improvements are taking place within it, and our banks are well prepared to finance economic expansion.

Question. When you lectured the bankers, did you fear there would be failures among the big banks?

Answer. I had some fears that, unless bankers mended their ways, some very troublesome situations could develop. But bear this in mind:

We've had only a small number of bank failures in our country in recent years, although two or three of these failed banks were quite large. During the 1920s and early 1930s, by way of contrast, some 12,000 banks failed. Moreover, the few bank failures that we've had recently have not resulted in losses to depositors. The banks continued to do business under a new arrangement, and bank-customer relationship were maintained.

So our banking system has been tested very severely in the course of the recent recession—the deepest since the 1930s—and the test has been well met.

ON LOANS ABROAD, "RECORD IS GOOD"

Question. Are you worried about the loans American banks have made to underdeveloped countries?

Answer. Thus far, losses in connection with loans made to foreign enterprises or foreign governments have been much smaller than losses on loans made to domestic borrowers. Some of those foreign loans are made to American enterprises operating abroad.

As for loans to foreigners, a foreign government that has borrowed abroad and has permitted its business firms to borrow extensively abroad has a strong stake

in maintaining its reputation. Even when interest payments are difficult to meet, a serious effort is made to keep payments current so that the reputation of the country for financial integrity will not suffer.

The record so far is good. That doesn't mean it will necessarily remain good. This is an area where I feel that our banking firms should be very cautious, since their loans abroad have grown to very large sums.

One of the secrets of good banking is balancing your portfolio. Too large a fraction of loans made to the less developed countries—or to any single category of borrowers—could be an invitation to trouble. This is something that our bankers are aware of, and I think they are pursuing more prudent policies now than they did two or three years ago, or even a year ago.

[From the Washington Post, May 13, 1976]

THE COMING PROBLEM OF INFLATION

(By Hobart Rowen)

Economic recovery has been moving along at a fast pace, and has now reached a point where it can properly be called an expansion. Not a boom, mind you, but a solid expansion.

No one takes greater satisfaction in the fast step-up in economic activity and the sharp step-down in the rate of inflation than Federal Reserve Board Chairman Arthur F. Burns.

Burns was not at all immodest in testimony before the House Banking Committee a few days ago in claiming that the Federal Reserve is entitled to a good deal of credit. The Fed stubbornly resisted demands last year that a faster rate of monetary growth was needed to stimulate recovery.

It is hard to argue with him. Burns and the Fed were right, and almost everybody else was wrong. Even Ford administration officials, who feared at the beginning of 1976 that money supply growth was too low, are ready to admit that on this one Dr. Burns called the turn.

On the basis of past performance, Burns' forecast for what lies ahead deserves close attention. He predicts, first of all, no letup "as yet" in the pace of expansion.

Financial market conditions remain favorable for a continuing upturn, he says. Interest rates have been edging down, even for mortgage loans, which is a fillip for the still depressed homebuilding industry.

Banks have been lowering the prime lending rate, with the First National City Bank dropping its charge to best customers to 6.5 per cent. That's a far cry from the peak of 12 per cent in mid-1974, and should encourage business borrowing.

Meanwhile, the Fed chairman notes, stock market prices have soared, which not only makes everybody feel better, but makes it easier for companies to raise funds, or build "equity cushions."

Even the banks that got overextended in the 1970's permitting "their financial condition to deteriorate," are in better shape and have been giving "greater attention to prudent management," Burns assures us.

Consumer confidence, evidenced by a faster pace in the sales of autos and other goods, has improved. And there are signs of a "quickenning tempo" of activity in the sluggish capital goods industry.

It is not a perfect economic picture that the cautious Arthur Burns sketches. The unemployment rate looks uncomfortably static at 7.5 per cent. But the general condition of the economy is considerably better than it was just a few months ago, and much perkier than anyone thought it would be at this stage.

Private economists agree with Burns. "So far," says economist Beryl Spinkel of the Harris Bank and Turst Co. of Chicago, "it's a moderate recovery. The rise is somewhat slower than the recovery from the 1957-58 downturn, and I'm glad it is."

Otto Eckstein of Data Resources Inc., agrees with Burns that recovery is solid. In fact, he predicts that the first quarter real GNP growth rate of 7.5 per cent assures significant additional gains for the rest of the year, with 6.9 per cent for 1976 as a whole.

Jimmy Carter's chief economic adviser, Lawrence R. Klein of the Wharton School, sticks to a 6.2 per cent real GNP forecast for this year, but sees a much faster recovery in jobs, with consequent added pressure on prices.

Thus, the big imponderable ahead may be the course of prices. No one seems to believe that the extremely low annual inflation rate of the first quarter (around 3 per cent) can last very long.

Sensitive raw materials prices have been creeping upward. In the absence of any meaningful government policy on wages and prices, big increases in wholesale metals prices are now working their way through the system, and will be reflected later in consumer goods prices.

Burns decided, as a matter of insurance, to try to nudge latent inflationary pressures down by reducing monetary growth targets a fraction. This may or may not make an actual difference, as experience both in this country and West Germany shows.

The way the economy is acting suggests that one bread-and-butter issue for the Democrats in the fall may be an inflationary bubble. True, it's not going to be a double-digit nightmare. But as the administration has made clear about unemployment, it's not the level but the trend that counts.

[From Newsweek magazine, June 2, 1975]

CONGRESS AND THE FEDERAL RESERVE

(By Milton Friedman)

Two recent events have produced a major change in the structure of monetary policy—perhaps the most important change since the banking acts of the mid-1930s. These are a joint Congressional resolution on monetary policy and the testimony by Federal Reserve chairman Arthur Burns in response to the resolution.

House Concurrent Resolution 133, sparked by Senators William Proxmire, Hubert Humphrey and James Buckley, has two provisions expressing “the sense of Congress”: one, which is of minor and passing importance, that the Fed “pursue policies in the first half of 1975 . . . appropriate to facilitating prompt economic recovery”; the second, which is of major and potentially permanent importance, that the Fed “maintain long-run growth of the monetary and credit aggregates commensurate with the economy’s long-run potential to increase production.”

CONCURRENT RESOLUTION

The resolution has no teeth. It simply provides that the Fed “consult” Congress semiannually about its “objectives and plans” for monetary growth and “report to the Congress the reasons” for any subsequent departure from those objectives.

Though superficially innocuous, the resolution represents the first time since the Fed began operation in 1914 that Congress has (1) specified monetary and credit aggregates as the Fed’s immediate target, (2) enjoined it to produce steady monetary growth in line with output growth, (3) required it to state its objectives publicly in advance, and (4) required it to justify publicly any departure from them. All four elements are major changes. The Fed has shifted among alternative targets—monetary aggregates, interest rates, exchange rates; it has produced widely varying rates of monetary growth; it has never specified long-range numerical objectives and has decided its short-term objectives *in camera*, making them public only long after the event; it has reported to Congress in vague terms that have resisted strict accountability.

Even if the Fed chooses precisely the same objectives under the new procedure as it would have chosen under the old, the requirement that it state them publicly *in advance* and justify failure to achieve them makes it far more likely that they will be achieved. In the past few years, the Fed has erred less in the monetary objectives it has chosen than in its unwillingness to make the changes in its methods of operation required to achieve them.

CHAIRMAN BURNS’ TESTIMONY

Burns’ testimony is noteworthy for both its spirit of wholehearted cooperation with the Congressional initiative, and its content.

Burns specified the Fed’s objective for the “twelve months from March 1975 to March 1976” as an increase of 5 to 7½ percent for M₁ currency plus demand deposits).¹ As he said, “this is a rather high rate of expansion by historical stand-

¹ For other aggregates, he listed increases of 8½ to 10½ per cent for M₂, 10 to 12 per cent for M₃, and 6½ to 9½ per cent for the credit proxy.

ards." I would prefer a lower rate. But it is more moderate than many critics have been demanding, and, given both the abnormally low rates of monetary growth in the prior six months and the severity of the recession, tolerable if not long continued.

Chairman Burns recognized explicitly that these "rates of growth in monetary and credit aggregates . . . could not be maintained indefinitely without running a serious risk of releasing new inflationary pressures." In my opinion, these rates would produce a long-run rate of inflation of some 6 or 7 percent a year and a decidedly higher interim rate. I therefore applaud his statement that "as the economy returns to higher rates of resource utilization, it will be necessary to reduce the rate of monetary and credit expansion." This conclusion is entirely consistent with the concurrent resolution's emphasis on "long-run growth . . . commensurate with the economy's long-run potential to increase production"—which implies roughly a 2 to 4 percent a year growth rate for M_1 .

I have long feared that continuation of past patterns of monetary behavior would produce an overreaction to the current recession, which would reignite inflation by 1977 or so. On past performance, that is certainly the most likely outcome. But these recent actions by Congress and the Fed give at least some reason to hope that the lessons of the past have been learned and that a new day has dawned for the Fed and for the country.

[From the Wall Street Journal, May 19, 1976]

A VOTE FOR TODAY'S SYSTEM

(By Allan H. Meltzer¹)

The rate of increase of consumer prices in the United States has fallen, gradually, from nearly 14% in mid-1974 to an average rate of about 6% for the past six months. Some further reduction in the average rate of inflation is likely to occur in 1976.

Experience in the rest of the world covers a wide range. Some countries substantially reduced the rate of price increase; in others the rate of increase remained high. During the year 1975, consumer prices rose by more than 20% in Britain, by approximately 10% in France, Italy and Canada, and by 5% or less in Germany and Switzerland.

Why are the rates of price increase in these countries so different? Why is inflation no longer proceeding at high or rising rates everywhere? Why have some countries succeeded in reducing inflation where others have failed?

The answer to these questions is surprisingly simple. Government policies toward inflation have differed. Some countries recognized inflation as mainly a monetary phenomenon, the result of too much money in circulation, and took effective action to control inflation. The countries that now have the lowest rates of inflation—Switzerland, Germany and the United States—are the same countries that changed their approach to monetary control. Each of the countries has, in its own way, chosen a target rate of increase in money. Each has managed to keep the growth rate of money close to the announced target.

Where the rate of growth of money has been reduced, the rate of inflation has been reduced. Where monetary growth has been kept at a high rate, the rate of inflation has remained high or has increased.

THE BRITISH EXAMPLE

Britain is an outstanding example. During the past year most countries experienced less inflation, but Britain experienced more. British consumer prices rose by 16% in 1974 and by more than 20% in 1975. Even Italy, with its severe political, social and economic problems, was able to slow inflation, to reduce the rate of increase in consumer prices from 1974 to 1975. But Britain did not.

Economists differ about why inflation starts and about how inflation can be reduced and ended. For decades influential British economists argued that it was unnecessary to control the rate of monetary expansion. Some argued that the way to end inflation was to stimulate the economy by government policies that create jobs and output. By increasing output they hoped to lower prices or the

¹Mr. Meltzer is Maurice Falk Professor of Economics and Social Science, Carnegie-Mellon University. This article is adapted from a speech given before the American Society of Newspaper Editors.

rate of inflation. Contrary to experience everywhere they sought to end inflation by stimulating the economy.

The result was predictable, and both the predictions and the results are part of British history. Inflation increased. An economically weak Britain became weaker.

Programs similar to those that failed in Britain are advocated and at times adopted here. We followed the British into stop and go policies—policies to stimulate the economy today and take care of the inflation tomorrow. We achieved *more* inflation and currently have *more* unemployment. We followed the British and other Europeans in attempting to control inflation by using government intervention in wage and price disputes. Inflation did not stop. It increased.

The policies of the past year and the results they achieved are a means of discriminating between the differing opinions about the causes of inflation and the means of ending inflation. Some prominent economists urged rates of monetary expansion in 1975 as high as 16%, and a rate of monetary growth of 10% in 1976. They argued that with unemployment high, strong stimulus would reduce unemployment and reduce inflation.

If we had adopted very expansive policies we, like the British, would have experienced rising inflation in 1975 and 1976. Instead of a falling rate of inflation, we would now have a rising rate of inflation.

The marked difference in countries' experience with inflation during 1975 and 1976 is not a unique event. Recent experience is only a repeat of the experience of the late forties with a change in the roles chosen by the governments of particular countries. Then, and now, the countries that promptly reduced the rate of monetary growth ended inflation promptly. Countries that experimented with controls on prices and wages, with restrictions on credit or that engaged in fine tuning of taxes and government spending continued to experience inflation.

No sustained inflation has ever been ended until the growth rate of money has been reduced. Inflation at the end of World War II, after the Korean war, and in other times and places were ended by controlling money. The experiences of the past two years are in this respect consistent with the past.

Why can't we fight inflation? I will answer not only that we can, but we have. Barring some new shock like the oil price increase, a crop failure, or a war, we can expect the economy to approach full employment in about two years if government policies are less erratic in the future than in the past. We cannot expect, however, to reach full employment without inflation. In this respect, as in so many others, government promises and performance differ.

Ending inflation means bringing the average rate of price change, properly measured, to zero. We *are* fighting inflation. Inflation has been reduced, but we will *not* end inflation unless we change some government policies and continue others.

I believe we can end inflation in the next few years. To do so, we must adhere to four principles of economic policy.

REDUCE GOVERNMENT GROWTH

First, we must continue the present international monetary arrangement known as the fluctuating exchange rate system. Under the fluctuating rate system, we rely on the market and not on governments to determine the current exchange value of our currency. The exchange value of the dollar fluctuates, rising with increases in the demand for dollars and falling when we speed up the printing press and increase the supply of dollars. The fluctuating exchange rate protects us against inflationary (or deflationary) economic policies abroad. If foreign governments adopt policies more inflationary than ours, and many foreign governments have, the fluctuating dollar helps us to avoid inflation. We are freer to pursue stable prices.

Second, we must reduce the growth of government. A high growth rate of government transfers spending from private to public hands, and reduces efficiency. Growth of public employment transfers skilled labor from more productive to less productive activities and slows the growth of the economy. Government regulation absorbs skilled personnel in countless wrangles with the bureaucracy, increases uncertainty and deters investment. But the principal effect of a growing public sector on inflation is not from the loss of efficiency and growth. A rising government budget creates strong pressure to finance the government by printing money. Our current inflation began when we tried to finance war and social programs in the middle sixties without raising taxes. Despite a 400% increase in the federal budget, in little more than a decade, costs of social programs continue to increase and the problem of financing the budget without increasing taxes remains a force for inflation.

Third, we must continue to reduce the growth rate of money gradually. Between 1973 and 1976, the rate of monetary growth has been lowered from 9% to about 5%. This reduction is the most important force working to reduce present and future inflation. During the next two or three years, the rate of monetary expansion must be brought, gradually, to about 3%. Once we fully adjust to the lower rate of growth in money, the economy will be at full employment without inflation.

Fourth, we must avoid price and wage controls and government interference in price and wage decisions.

Let me summarize the program. (1) Maintain fluctuating exchange rates. (2) Reduce the growth rate of government. (3) Gradually slow the rate of monetary growth. (4) Avoid controls.

[Whereupon, at 1:10 p.m., the subcommittee recessed subject to the call of the Chair.]

